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DocumentType Site Assessment Rpt (SAR)

RptSegment

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1/15/2003

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2/20/2007

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WASTE MANAGEMENT

Section

SUPERFUND

Program

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BY:

Environmental Services, P.C.

VIA ONE DAY UPS

January 22, 2003

North Carolina Department of Environment and Natural Resources Attn: Mr. Charles F. Stehman, Ph.D., P.G., Environmental Regional Supervisor I Division of Water Quality, Groundwater Section Wilmington Regional Office 127 Cardinal Drive Extension Wilmington, NC 28405

RE: Transmittal of Environmental Report

Watson Property, Tabor City, North Carolina

CES Project No. 02141

Dear Dr. Stehman:

In accordance with our recent meeting, please find enclosed a copy of the report entitled *Phase II* Site Characterization Report and Corrective Action Proposal, dated January 15, 2003.

Should you have any questions or require additional information, please do not hesitate to call. We appreciate your input on this matter.

Sincerely,

R. Paul Clark, P.G.

John Radron Po for

President

Enclosure

cc: Mr. Trent Burroughs, ABCD Enterprises, LLC, Tabor City, North Carolina

Mr. Dennis T. Worley, Esquire, McGougan, Wright, Worley, Harper and Bullard. L.I.P., Tabor City, North Carolina

s/02141/corr/transstehman.wpd

PHASE II SITE CHARACTERIZATION REPORT AND CORRECTIVE ACTION PROPOSAL

OF THE

DONALD WATSON LANDS

PIREWAY ROAD TABOR CITY, NORTH CAROLINA

CES PROJECT NO. 02141

PREPARED FOR

ABCD ENTERPRISES, LLC

TABOR CITY, NORTH CAROLINA

JANUARY 15, 2003



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JANUARY 15, 2003



PREPARED BY

CLARK ENVIRONMENTAL SERVICES, P.C.
POST OFFICE BOX 10136
WILMINGTON, NORTH CAROLINA 28404-0136
(910) 602-3900

(ES)



PAGE

TABLE OF CONTENTS

1.0	BACKGROUND AND PURPOSE	1
2.0	METHODS	2
3.0	FINDINGS	2
4.0	CONCLUSIONS AND RECOMMENDATIONS	5
5.0	LIMITATIONS	6

LIST OF TABLES

TABLE 1	MONITORING WELL AND GROUNDWATER LEVEL DATA
TABLE 2	FIELD PARAMETERS AND LABORATORY RESULTS FOR
	GROUNDWATER AND WATER SUPPLY SAMPLES

LIST OF FIGURES

FIGURE 1	TOPOGRAPHIC MAP DEPICTING PROJECT LOCATION
FIGURE 2	STUDY AREA MAP DEPICTING MONITORING WELL AND SOIL BORING
	LOCATIONS
FIGURE 3	STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE
	CONTOURS BASED ON MEASUREMENTS OBTAINED ON 11/04/02
FIGURE 4	STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE
	CONTOURS BASED ON MEASUREMENTS OBTAINED ON 11/15/02
FIGURE 5	STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE
	CONTOURS BASED ON MEASUREMENTS OBTAINED ON 12/18/02
FIGURE 6	STUDY AREA MAP DEPICTING ESTIMATED LOCATION OF SURFICIAL
	NITRATE (MG/L) CONTAMINANT PLUME
FIGURE 7	STUDY AREA MAP DEPICTING ESTIMATED LOCATION OF SURFICIAL
	NITRITE (MG/L) CONTAMINANT PLUME
FIGURE 8	COLLECTION WELL SCHEMATIC

LIST OF APPENDICES

APPENDIX I	AERIAL PHOTOGRAPH (1999) DEPICTING ENTIRE SUBJECT
	PROPERTY
APPENDIX II	STANDARD METHODS
APPENDIX III	BORING LOGS, AS-BUILT WELL DETAILS, AND WELL
	CONSTRUCTION RECORDS
APPENDIX IV	SAMPLING RECORDS, LABORATORY RESULTS, AND CHAIN OF
	CUSTODY FORMS
APPENDIX V	REFERENCES



PHASE II SITE CHARACTERIZATION REPORT AND CORRECTIVE ACTION PROPOSAL

OF THE

DONALD WATSON LANDS PIREWAY ROAD TABOR CITY, NORTH CAROLINA

CES PROJECT NO. 02141

JANUARY 15, 2003

1.0 BACKGROUND AND PURPOSE:

The study area is a portion of a 47-acre tract which consists of five individual tax parcels. It is located in a developing area at the intersection of NC Highway 904 (Pireway Road) and US Highway 701, at 1003-1007 Pireway Road, inside the city limits of Tabor City, North Carolina, in Columbus County. **Figure 1** is a topographic vicinity map and **Figure 2** is a map depicting the study area. In addition to wooded areas and overgrown crop fields, there are several buildings present at the site. A historical aerial photograph, depicting the entire 47 acre tract and the study area, is included for reference in **Appendix I**.

The presence of a 10,000 gallon aboveground nitrogenous fertilizer tank, observed during the performance of a Phase I Environmental Site Assessment investigation, prompted an initial check of groundwater conditions in the vicinity of the tank (which has since been removed from the site). An initial monitoring well (MW1) was installed and sampled. The laboratory analyses revealed concentrations of nitrate exceeding groundwater standards set forth in Title 15A of the North Carolina Administrative Code, Chapter 2, Subchapter 2L (15A NCAC 2L).

The current Phase II investigation was expanded through the installation and sampling of additional monitoring wells in order to characterize the magnitude and extent of contamination, and to determine hydrogeologic conditions with reference to fate and transport of contaminants.

The purpose of this report is to respond to the discovery of nitrogenous groundwater contamination at the subject facility, and to propose the implementation of corrective measures pursuant to requirements contained in 15A NCAC 2L. This work product is intended to be submitted to the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Quality (DWQ), Groundwater Section. Wilmington Regional Office, located in Wilmington, North Carolina.

2.0 METHODS:

The Phase II investigation was accomplished by the installation, surveying and sampling of a total of six surficial (12-foot deep) monitoring wells (MW1-MW6), and two deeper (25-foot deep), discretely screened monitoring wells (DW1 and DW2). Subsequent to the installation of hand augered MW1, the remaining wells were installed using a drill rig and hollow stem augers. All wells were logged and field screened. In addition, a total of eight soil borings were advanced and logged in the area surrounding the fertilizer tank, in order to generally characterize the extent of unsaturated zone soil contamination as suggested by the presence or absence of a detectable odor.

The investigation was performed according to general industry practices and pursuant to methodologies described by Clark Environmental Services, P.C. (CES) Standard Methods (Appendix II), and NCDENR guidelines for the assessment and remediation of groundwater (References). Boring logs, as-built well details and well construction records are enclosed in Appendix III. Sampling documentation, laboratory results, and chain of custody records are found in Appendix IV.

3.0 FINDINGS:

3.1 HYDROGEOLOGIC SETTING:

3.1.1 Topographic Features:

Figure 1 depicts a portion of the 7.5 minute USGS topographic map of the general vicinity (Tabor City East, NC 7.5 minute quadrangle). The site is located at an elevation of approximately 100 feet above mean sea level, and is gently sloped to the north and east.

The property includes a small irrigation pond, positioned approximately 900 feet north of the current target study area (**Appendix I**). A 2.5 foot deep subsurface storm water drain extends between the warehouse and the study area and ultimately discharges into an eastward directed 4 to 5 foot deep storm ditch, which is believed to, at least intermittently, intersect the shallow surficial aquifer approximately 200 feet downgradient. The nearest perennial stream is Skeebo Branch, located approximately 1,800 feet east of the former fertilizer tank area, and facing the eastern property line.

3.1.2 Physiography:

The site is located in the Atlantic Coastal Plain physiographic province, where sedimentary strata generally dip eastward at a rate of approximately 20 feet per mile. In general, groundwater recharge occurs on upland interfluve areas and discharge occurs along streams and rivers. This site is bounded to the east by a small stream, which is interpreted to discharge groundwater from the

upper portion of the surficial aquifer. Conceptually, the site is positioned within a recharge area and shallow groundwater is expected to flow generally in the direction of the stream, with a downward vertical component at the study area.

3.1.2 Site Specific Geology:

According to the 1985 Geologic Map of North Carolina, the site is situated upon a surficial sedimentary sequence mapped as the undivided Pliocene Yorktown Formation (fossiliferous clay with some sand) and Duplin Formation (shelly medium to coarse sand, sandy limestone, and limestone). In this area, these undifferentiated units are approximately 70 feet thick and overlay sequentially older sedimentary strata, including the Cretaceous-age Peedee and Black Creek Formations, which are common target aquifers for high volume supply wells. The Cretaceous units overlay a Paleozoic basement complex of igneous and metamorphic rocks (Winner, M.D. and R.W. Coble. 1996, Hydrogeologic Framework of the North Carolina Coastal Plain, U.S.G.S. Professional Paper 1404-I).

Boring logs generated during the installation of monitoring wells reveal that the site is generally underlain by sand (0-4 feet), sandy clay (4-6 feet), dense clay (6-12 feet), fine sand (12-14 feet) and silty clay (14-25 feet).

3.1.3 Groundwater Occurrence and Flow:

The depth to groundwater in the study area has been measured at approximately 2.5 to 5.0 feet below ground level. It is noteworthy, as documented in **Table 1**, that deeper wells DW1 and DW2, as compared to nearby shallow wells MW1 and MW4, respectively, document a 1.5 to 2 foot potentiometric head decrease. This is indicative of a downward flow component.

Figures 3, 4 and 5 represent potentiometric surface contours developed during the investigation. Horizontal flow appears to generally be directed eastward; however, a consistent pattern was not depicted in the development of Figure 5. The potentiometric contours may illustrate differential recharge rates, including a shadow effect of the warehouse building, localized effects of routed storm drainage, and, possibly, withdrawals from a nearby supply well (Appendix I).

(ES)

3.1.4 Land Use and Local Water Supplies:

The study area is located on a 47-acre tract which has been utilized for light industrial (tobacco warehouse), agricultural (greenhouse and nursery) and residential purposes. Surrounding property usages to the north include a car wash, an ABC store, a bank and a gasoline station. A shopping center and vacant parcels are located to the west. Residences are present to the south, and low wetlands to the south and east exist along the flood plain of Skeebo Branch.

Municipal water and sewer service are available and used by residents and commercial occupants in the area; however, one operable and two reportedly inoperable irrigation supply wells are located on the subject property within approximately 400 to 800 feet of the study area (**Appendix I**). According to Mr. George Smith of Smith Well Drilling and Repair (Tabor City, North Carolina), these wells are each 60 to 70 feet deep and are screened in a sand unit.

3.2 CONTAMINANT CHARACTERIZATION:

3.2.1 Groundwater Plume Summary:

Figures 6 and 7 depict nitrate and nitrite plume data and Table 2 lists laboratory and field analytical data. Following the initial detection of a relatively high concentration (8,800 milligrams per liter (parts per million (ppm))) of nitrate at MW1, additional wells were installed to characterize the magnitude and the horizontal and vertical extent of degraded groundwater. Although the precise extent was not established within the well network. concentrations do decrease substantially in horizontal and vertical directions. A sample from the operating irrigation well (SW2), located approximately 500 feet to the southeast, found nitrate at a concentration of 5.40 ppm. Although not a contravention of groundwater standards, this above-ambient concentration suggests effect by agricultural activities. The present study did not specifically address, nor speculate upon, this finding.

3.2.2 Unsaturated Zone Impacts:

As depicted on Figure 2, eight soil borings were advanced to a depth of five feet to empirically ascertain the presence of unsaturated zone contamination which would represent secondary source material. The olfactory findings suggest that such material exists only in immediate proximity to the former tank location, and, specifically, where loading connections were made.

4.0 CONCLUSIONS AND RECOMMENDATIONS:

Incremental historical releases of aqueous nitrogenous fertilizer from the operation of the aboveground tank resulted in impacts to the unsaturated zone and to the surficial aquifer. The groundwater impact was not completely defined, but appears to be confined to the property. Concentrations exceeding groundwater standards appear to be in relative proximity to the source area.

It is recommended that steps be taken to mitigate the effects of the release as outlined below:

- Conduct a limited excavation of the area immediately beneath the tank and foundation. The excavation is expected to encompass an area approximately ten feet by ten feet, but the actual size should be guided by field observations. The depth of the excavation should be approximately eight feet, which should provide for the removal of the highest contaminant concentrations in soil and shallow groundwater. A four-inch PVC sump comprised of slotted PVC screen and riser should be installed in the excavation as it is backfilled with gravel. The screen should extend upward to an approximate depth of three feet below ground surface (i.e., at the potentiometric surface) and the gravel to within 1.5 feet of the surface. The sump well should be completed using bentonite and grout in accordance with well construction standards. The gravel should be lined with plastic sheeting. Appropriate backfill should be used to fill the excavation, and the sump well should be completed in a traffic-bearing street box. Figure 8 is a schematic of the proposed collection well.
- A suitable pump should be installed in the collection well and the effluent should be connected to the existing irrigation system to be diluted and utilized in the fertilizing of a suitable crop such as Coastal Bermuda grass, which has a high nitrogen uptake capacity.
- The approximately 30 yd³ of excavated material should be spread to a one inch or less thickness across the crop fields at the site. This activity must be permitted by NCDENR. It is likely that NCDENR will require that the overall loading of nitrogen in land application of soil and irrigation water be computed and managed to provide for crop utilization of the applied nitrogen compounds. As an example, if Coastal Bermuda is used as the crop, a maximum of 400 pounds of nitrogen per acre might be stipulated.
- It is recommended that this report be submitted to NCDENR, DWQ, Groundwater Section, Attention: Dr. Charles F. Stehman, P.G. at the Wilmington Regional Office. 127 Cardinal Drive Extension, Wilmington, North Carolina 28405, for review and determination of regulatory requirements.

5.0 LIMITATIONS:

Information obtained and presented as part of this investigation is based on available data in an effort to understand and/or correct an existing or potential problem. The validity of any resulting conclusions is limited by methodological constraints and by the lack of a statistically significant number of data points. There is no warranty, expressed or implied, that additional or new information and/or additional measures will not be required to ultimately solve the problem. Additionally, Clark Environmental Services, P.C. assumes no responsibility for the validity of subjective or interpolated interpretations, whether or not implied or indicated. although an attempt is made to qualify such.

This environmental assessment is based on a review of available data and visual site reconnaissance. Subsurface environmental conditions were not addressed in detail. It is possible that this investigation may have failed to reveal the presence of hydrocarbons or hazardous waste contamination in excess of regulatory action levels on-site, other than those areas indicated in this report, where such contamination may exist. Although Clark Environmental Services, P.C. has used appropriate and mutually agreed upon procedures and technologies for this investigation, CES cannot guarantee that such contamination does not exist. Lead paint analyses and asbestos screening were not performed and are not addressed.

A complete chain of title history was not provided for the purposes of this investigation, but this is not believed to have detracted from the validity of the results or conclusions of the study. CES and its employees, agents or subcontractors are not responsible for any false or misleading information obtained from the sources or individuals interviewed in connection with this investigation and are not responsible for any concealed conditions on the study site.

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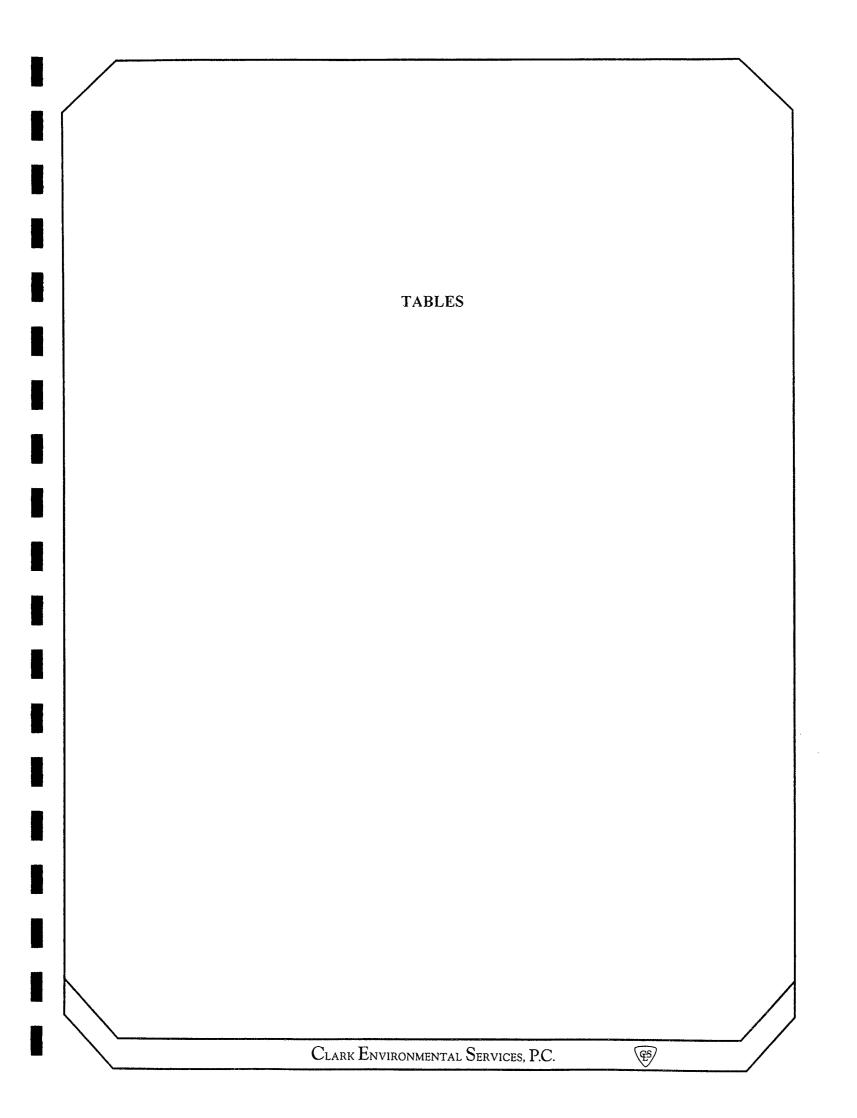


TABLE 1 MONITORING WELL AND GROUNDWATER LEVEL DATA WATSON LANDS, TABOR CITY, NORTH CAROLINA CES PROJECT NO. 02141

f -							POTENTIO-
WELL	MEASURMENT	WELL	WELL	TOP OF	DEPTH TO	FREE	METRIC
NO.	DATE	DIAMETER	SCREEN	CASING	GROUND-	PRODUCT	SURFACE
			INTERVAL	ELEVATION	WATER	THICKNESS	ELEVATION
		(IN)	(FT)	(FT)	(FT)	(FT)	(FT)
MWI	10/17/02	2	1.7-11.7	99.12	3.09	0	96.03
MWI	11/04/02	2	1.7-11.7	99.12	3.83	0	95.29
MWI	11/11/02	2	1.7-11.7	99.12	3.31	0	95.81
MWI	11/13/02	2	1.7-11.7	99.12	2.99	0	96.13
MWI	11/15/02	2	1.7-11.7	99.12	2.77	0	96.35
MWI	12/18/02	2	1.7-11.7	99.12	3.07	0	96.05
MW2	11/04/02	2	2.0 - 12.0	98.63	3.76	0	94.87
MW2	11/11/02	2	2.0 - 12.0	98.63	3.53	0	95.10
MW2	11/13/02	2	2.0 - 12.0	98.63	2.83	0	95.80
MW2	11/15/02	2	2.0 - 12.0	98.63	3.00	0	95.63
MW2	12/18/02	2	2.0 - 12.0	98.63	3.30	0	95.33
MW3	11/04/02	2	2.0 - 12.0	98.66	3.93	0	94.73
MW3	11/11/02	2	2.0 - 12.0	98.66	3.54	0	95.12
MW3	11/13/02	2	2.0 - 12.0	98.66	2.95	0	95.71
MW3	11/15/02	2	2.0 - 12.0	98.66	3.02	0	95.64
MW3	12/18/02	2	2.0 - 12.0	98.66	3.03	0	95.63
MW4	11/11/02	2	2.0 - 12.0	98.32	2.83	0	95.49
MW4	11/13/02	2	2.0 - 12.0	98.32	2.10	0	96.22
MW4	11/15/02	2	2.0 - 12.0	98.32	2.45	0	95.87
MW4	12/18/02	2	2.0 - 12.0	98.32	2.78	0	95.54
MW5	11/11/02	2	2.0 - 12.0	98.27	3.02	0	95.25
MW5	11/13/02	2	2.0 - 12.0	98.27	2.47	0	95.80
MW5	11/15/02	2	2.0 - 12.0	98.27	2.62	0	95.65
MW5	12/18/02	2	2.0 - 12.0	98.27	2.86	0	95.41
MW6	12/18/02	2	2.0 - 12.0	99.55	3.88	0	95.67
DW1	11/13/02	2	20.0 - 25.0	98.60	4.20	0	94.40
DWI	11/15/02	2	20.0 - 25.0	98.60	5.01	0	93.59
DWI	12/18/02	2	20.0 - 25.0	98.60	5.13	0	93.47
DW2	12/18/02	2	20.0 - 25.0	98.69	4.34	0	94.35

NOTES:

- 1) All monitoring wells are surveyed using the top of casing as the data point.
- 2) All elevations are based on an assumed 100 ft. datum.

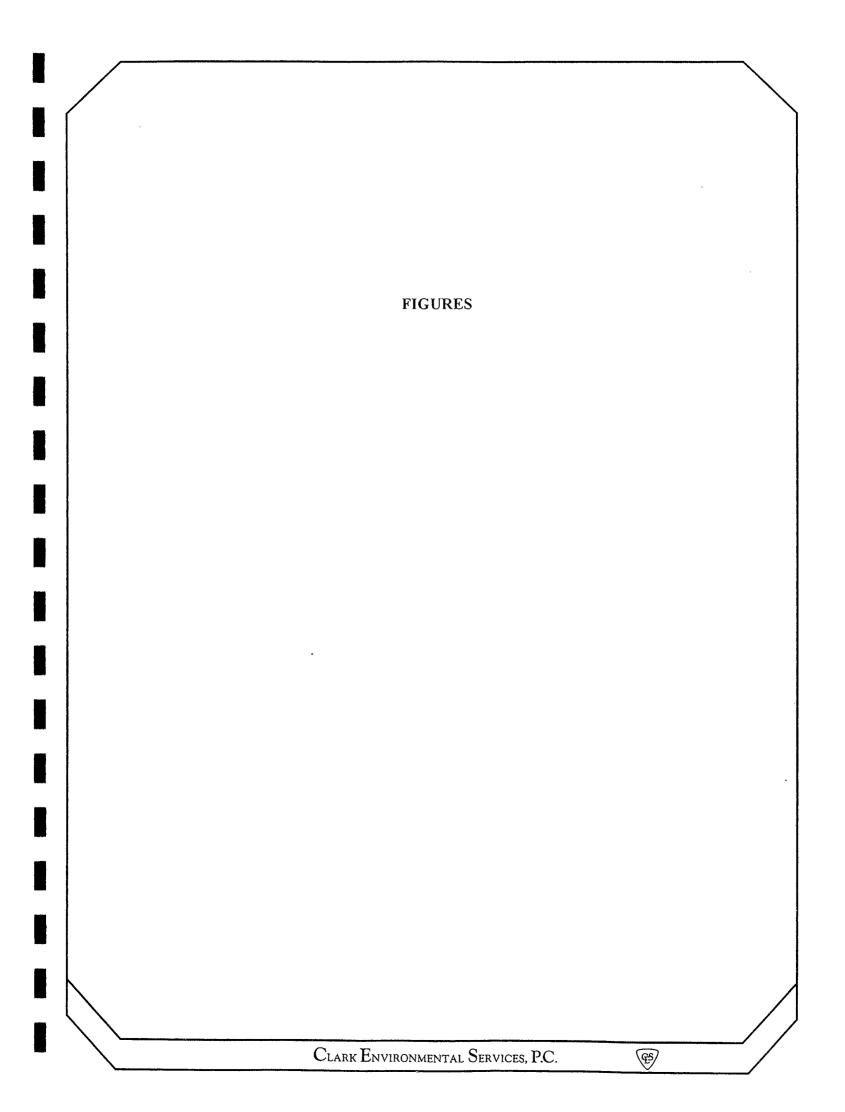
TABLE 2 FIELD PARAMETERS AND LABORATORY RESULTS FOR GROUNDWATER AND WATER SUPPLY SAMPLES WATSON LANDS, TABOR CITY, NORTH CAROLINA CES PROJECT NO. 02141

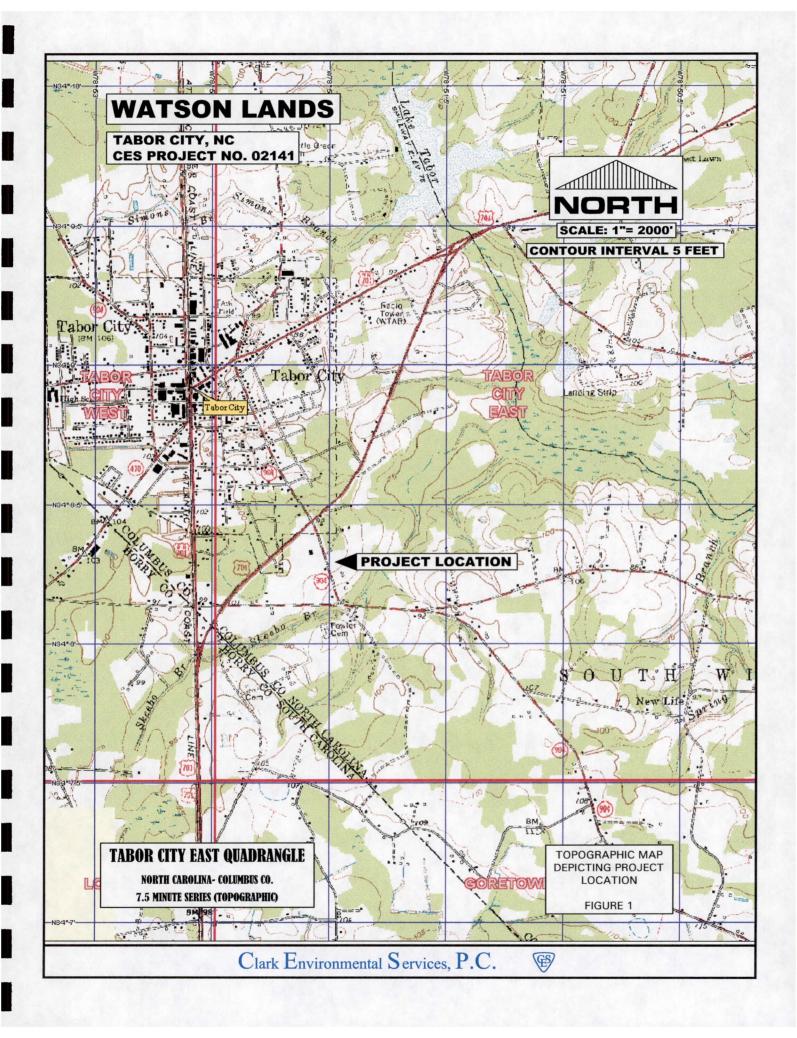
	FIELD PARAMETERS				LABORATORY ANALYSES				
				DISSOLVED	CONT	AMINAN'	TS OF CON	CERN	
SAMPLE LOCATION	DATE SAMPLED	pН	CONDUCTIVITY (mS)	OXYGEN (mg/L)	TEMPERATURE (*c)	NITRATE	TKN	AMMONIA	NITRITE
MW1	10/17/02	9.2	50,000	3.52	24	8,800.00	28,000	16,520	98.500
MW2	11/04/02	5.5	250	2.26	21	24.00	27.1	17.1	0.150
MW3	11/04/02	6.2	165	1.73	21	20.00	16.5	0.7	<0.025
MW4	11/11/02	6.2	95	5.24	23	11.00	11.3	0.8	<0.025
MW5	11/11/02	6.9	45	5.18	22	0.97	7.8	1.1	<0.025
MW6	12/18/02	9.9	67	3.46	NM	<0.2	1.0	<0.1	<0.025
DW1	11/15/02	8.9	40	4.09	24	0.24	0.1	<0.1	<0.025
DW2	12/18/02	8.5	359	1.68	NM	48.00	26.4	25	<0.025
SW2	11/13/02	9.0	105	6.28	19	5.40	0.5	0.1	<0.025
15A NCAC 2L		6.5-8.5				10	NS	NS	1

Notes:

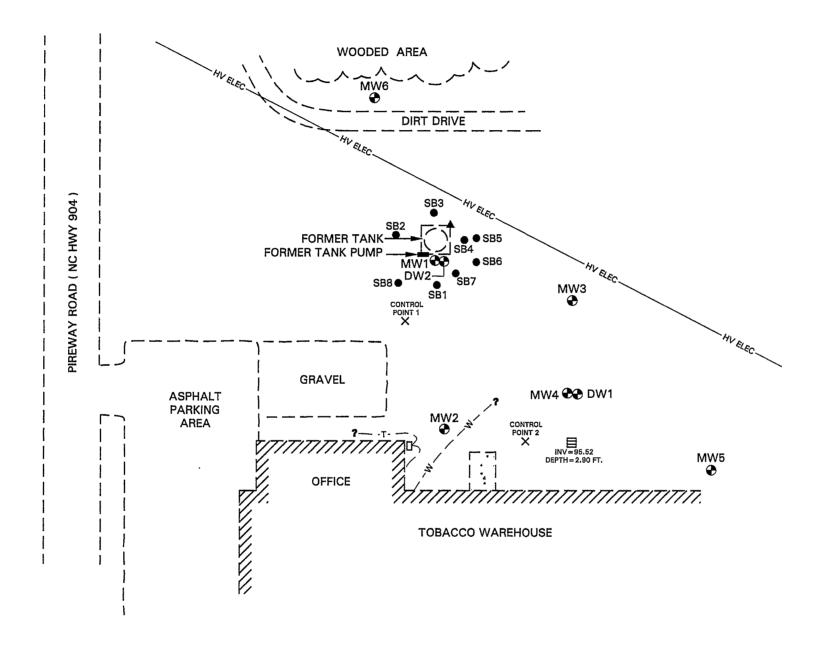
- 1) concentrations are presented in milligrams per liter (mg/L) unless otherwise noted
- 2) mS denotes millisiemens
- 3) TKN denotes total kjeldahl nitrogen
- 4) 15A NCAC 2L denotes Title 15A of the North Carolina Administrative Code, Chapter 2, Subchapter 2L Groundwater Standards
- 5) Bold denotes exceedence of 15A NCAC 2L Groundwater Standards
- 6) NS denotes the default application of the narrative standard. Such considers any concentration to represent an exceedence.
- 7) MW denotes Shallow Monitoring Well
- 8) DW denotes Deeper Monitoring Well
- 9) SW denotes Supply Well
- 10) NM denotes Not Measured

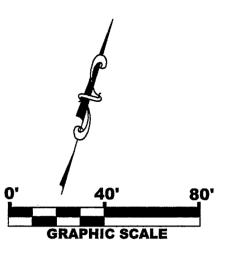
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TABOR CITY, NC CES PROJECT NO. 02141



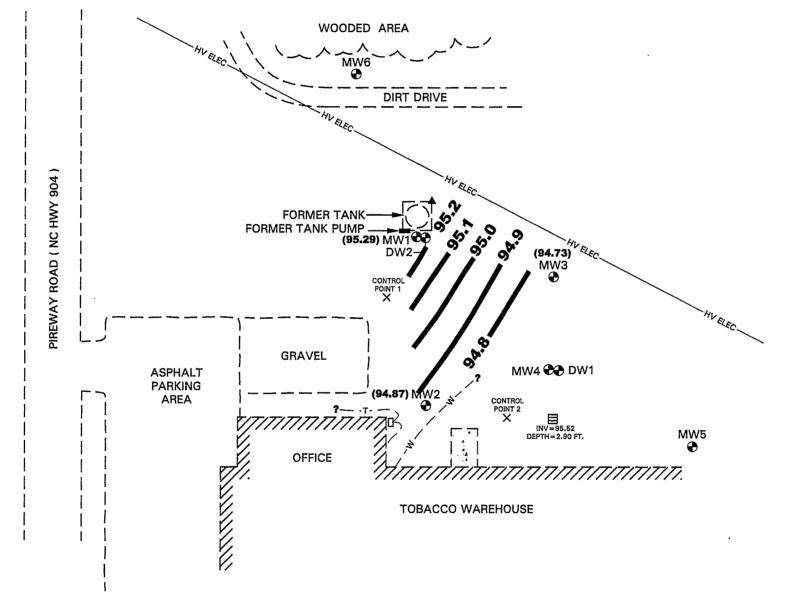


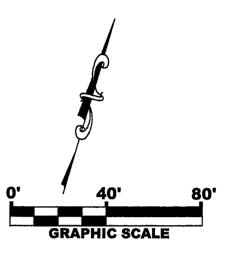
LEGEND

- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- **■** STORM DRAIN
- -HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC
 - -w- WATER LINE
 - -T- TELEPHONE LINE
 - SOIL BORING

STUDY AREA MAP DEPICTING MONITORING WELL AND SOIL BORING LOCATIONS

WATSON LANDS TABOR CITY, NC CES PROJECT NO. 02141





LEGEND

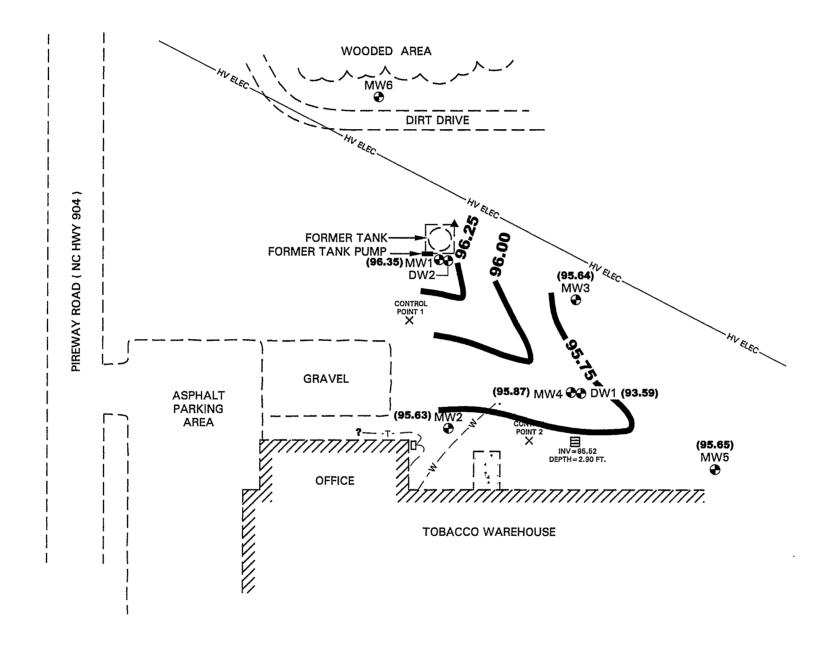
- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- ☐ STORM DRAIN
- -HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC
 - -w- WATER LINE
 - -T- TELEPHONE LINE

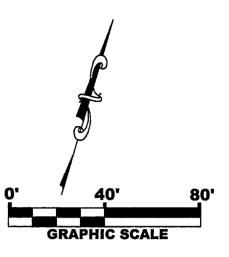
- 1) CONTOUR INTERVAL = 0.10 FT.
 2) ALL ELEVATIONS ARE BASED ON
 ASSUMED 100.0 FT. BENCHMARK.

STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE CONTOURS BASED ON MEASUREMENTS OBTAINED ON 11/04/02



TABOR CITY, NC **CES PROJECT NO. 02141**





LEGEND

- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- ☐ STORM DRAIN
- -HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC
 - -w- WATER LINE
 - -T- TELEPHONE LINE

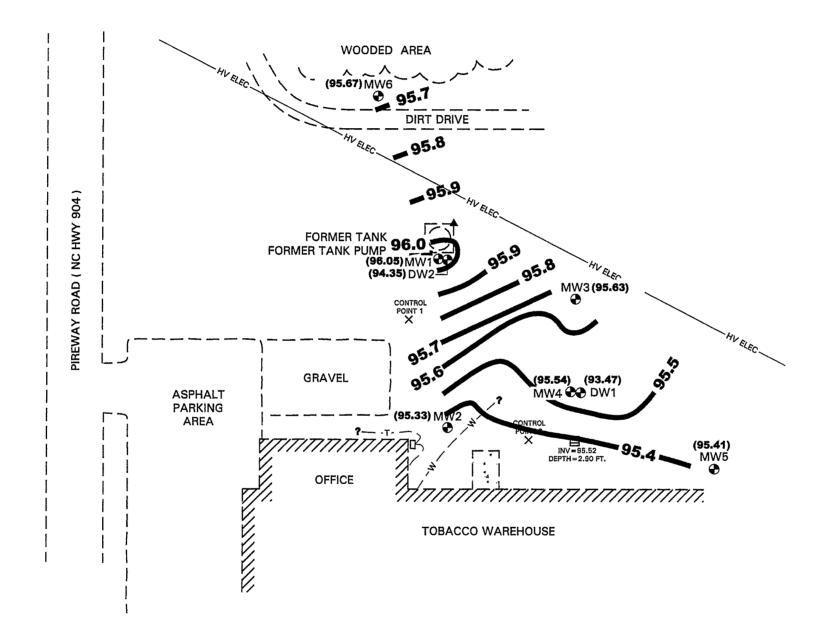
NOTES:

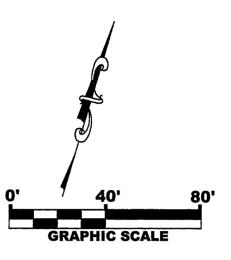
- 1) CONTOUR INTERVAL = 0.25 FT.
 2) ALL ELEVATIONS ARE BASED ON
- ASSUMED 100.0 FT. BENCHMARK.
 3) DW1 NOT UTILIZED IN CONTOURING.

STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE
CONTOURS BASED ON MEASUREMENTS **OBTAINED ON 11/15/02**



TABOR CITY, NC CES PROJECT NO. 02141





LEGEND

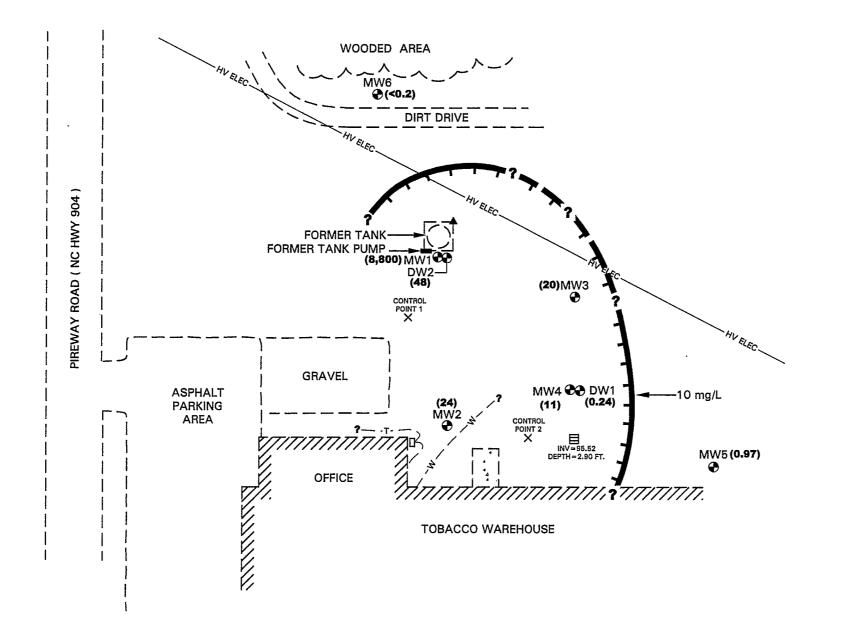
- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- **STORM DRAIN**
- -HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC
 - -W- WATER LINE
 - -T- TELEPHONE LINE

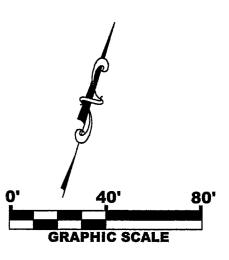
NOTES:

- 1) CONTOUR INTERVAL = 0.10 FT.
- ALL ELEVATIONS ARE BASED ON ASSUMED 100.0 FT. BENCHMARK.
- DW1 AND DW2 NOT UTILIZED IN CONTOURING.

STUDY AREA MAP DEPICTING POTENTIOMETRIC SURFACE CONTOURS BASED ON MEASUREMENTS OBTAINED ON 12/18/02

TABOR CITY, NC CES PROJECT NO. 02141





LEGEND

- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- **■** STORM DRAIN

-HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC

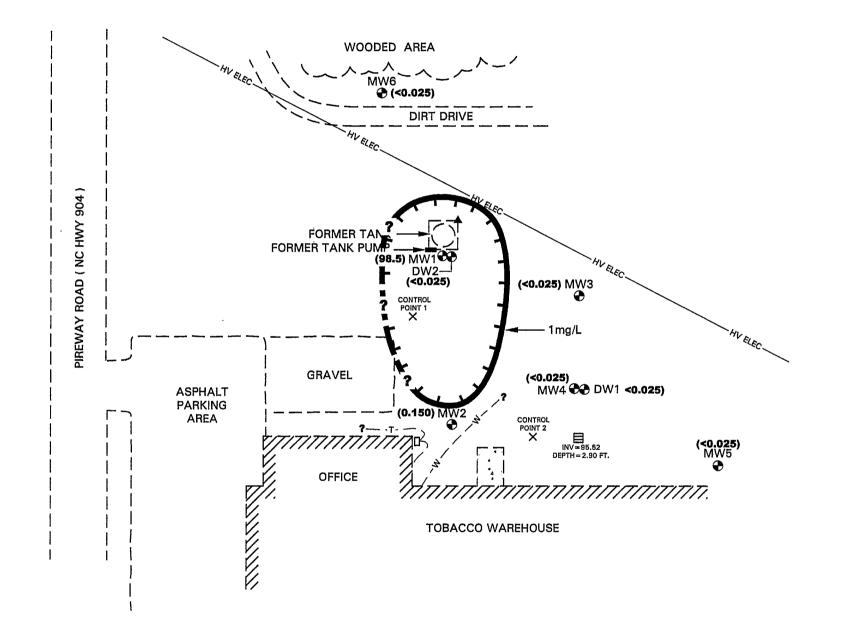
- -w- WATER LINE
- -T- TELEPHONE LINE

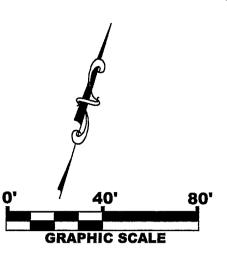
NOTES:

- 1) (#) REPRESENTS NITRATE CONCENTRATION.
 2) CONCENTRATIONS ARE REPRESENTED IN mg/L.
 3) 10 mg/L REPRESENTS THE 15A NCAC 2L
 GROUNDWATER STANDARD FOR NITRATE.

STUDY AREA MAP DEPICTING ESTIMATED LOCATION OF SURFICIAL NITRATE (mg/L) CONTAMINANT PLUME

TABOR CITY, NC **CES PROJECT NO. 02141**





LEGEND

- MONITORING WELL
- ▲ ASSUMED BENCHMARK
- **■** STORM DRAIN
- -HV ELEC- HIGH VOLTAGE OVERHEAD ELECTRIC
 - -w- WATER LINE
 - -T- TELEPHONE LINE

NOTES:

- 1) (#) REPRESENTS NITRITE CONCENTRATION.
 2) CONCENTRATIONS ARE REPRESENTED IN mg/L.
 3) 1 mg/L REPRESENTS THE 15A NCAC 2L
- GROUNDWATER STANDARD FOR NITRITE.

STUDY AREA MAP DEPICTING ESTIMATED LOCATION OF SURFICIAL NITRITE (mg/L) CONTAMINANT PLUME

TABOR CITY, NC CES PROJECT NO. 02141

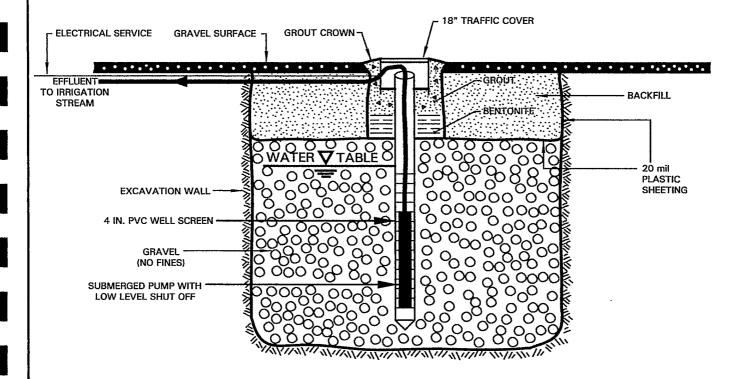


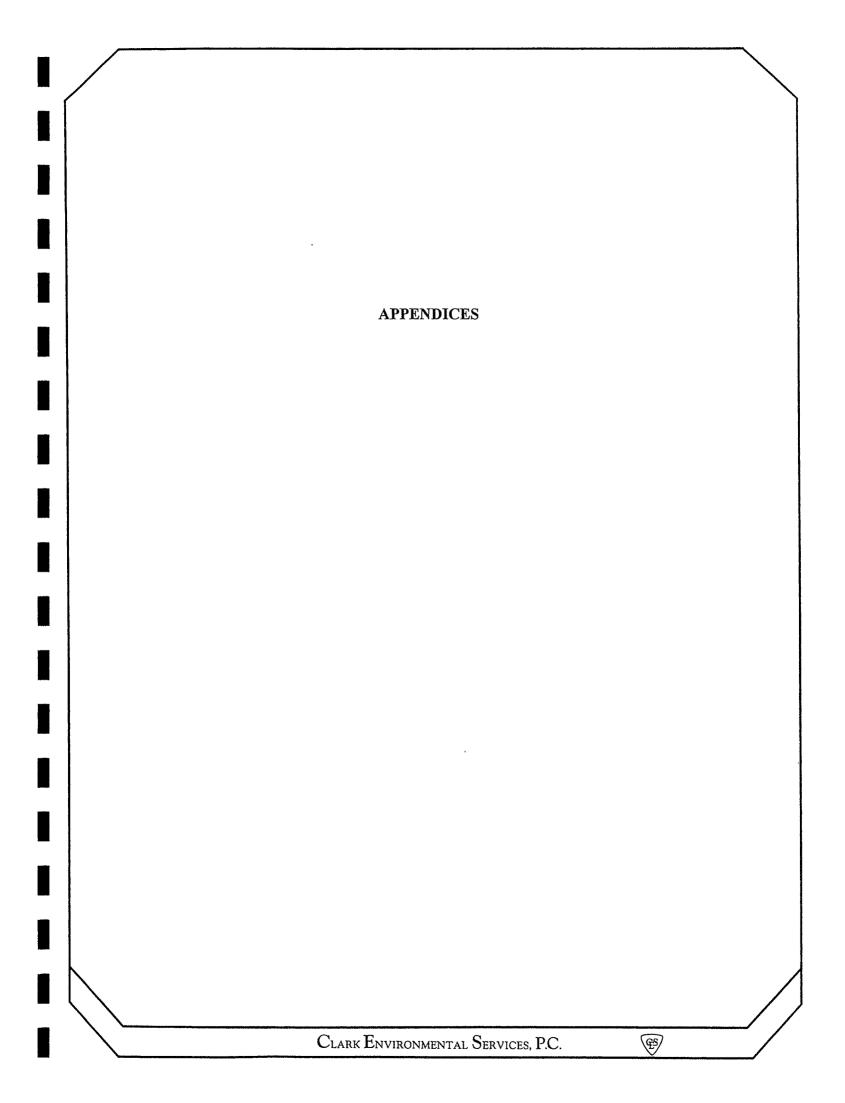
FIGURE 8

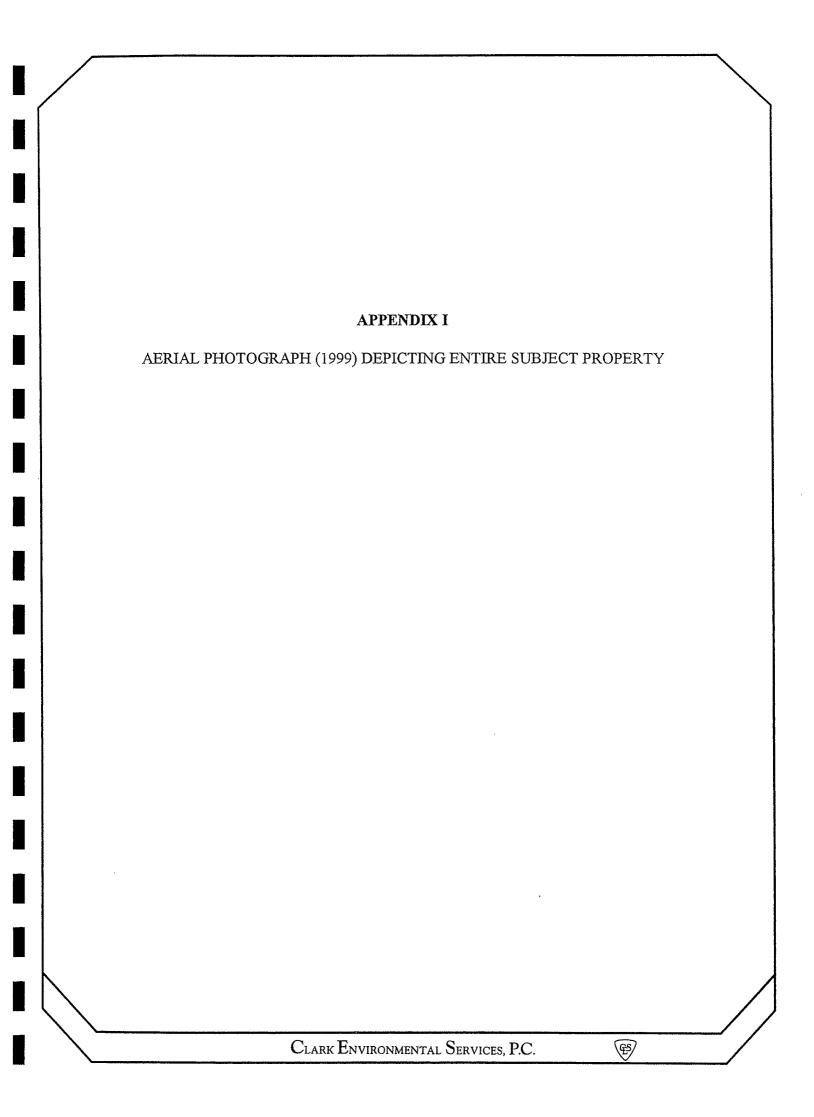
COLLECTION WELL SCHEMATIC

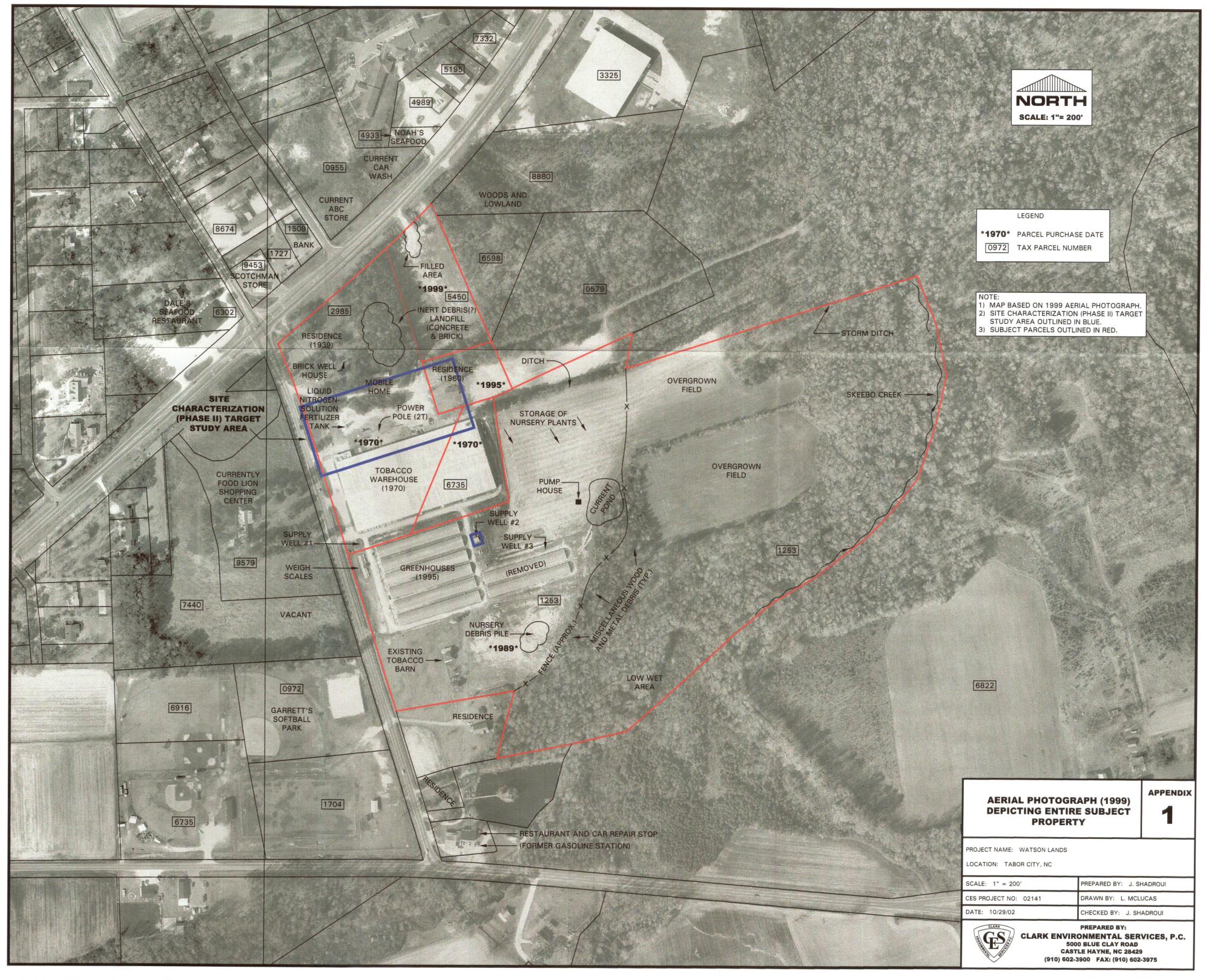
SCALE 1"=3'
(HORIZONTAL& VERTICAL)

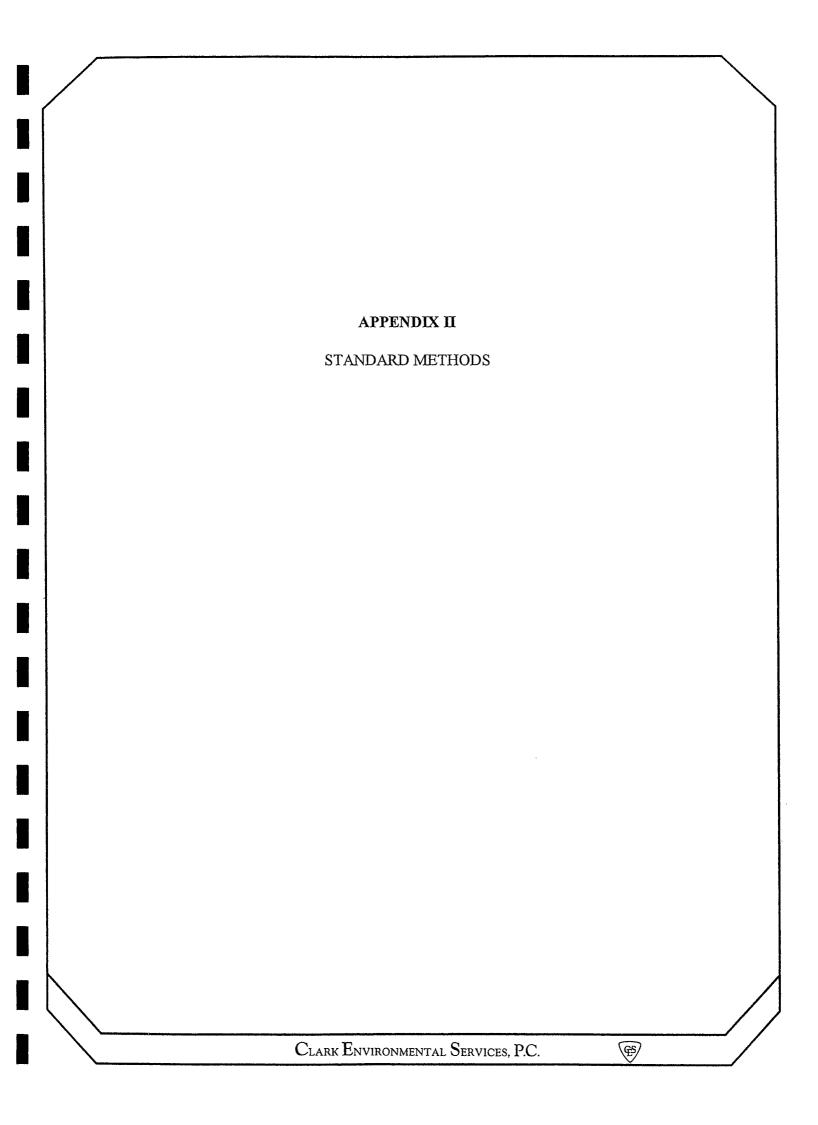
CLARK ENVIRONMENTAL SERVICES, P.C.











STANDARD METHODS FOR CONDUCTING SUBSURFACE ENVIRONMENTAL INVESTIGATIONS CLARK ENVIRONMENTAL SERVICES, P.C. (FS)

STANDARD METHODS FOR CONDUCTING

SUBSURFACE ENVIRONMENTAL INVESTIGATIONS

1.0 DATA COLLECTION:

1.1 PROJECT BACKGROUND:

Historical information relevant to comprehensive subsurface investigation is generated through a wide spectrum of potential sources. Those most often utilized as credible sources include, but are not limited to, the following:

- 1.1.1 Correspondence and/or conversations with clients, regulatory officials and attorneys;
- 1.1.2 Regulatory mandates;
- 1.1.3 Pre-existing reports and other technical data;
- 1.1.4 Public records;
- 1.1.5 Documented eyewitness accounts;
- 1.1.6 Site reconnaissance.

1.2 POTENTIAL RECEPTOR SURVEYS:

Potential plume receptor data is generated on a site-specific basis. The scope of information is based upon the intended level of investigation. The availability of data is dependent, to differing degrees, upon the existence and accuracy of public and private record keeping, and on property ingress and egress. Generally, an attempt is made to facilitate a reasonable determination of possible environmental impacts in the context of the investigation being conducted, with the goal of adequate and appropriate site assessment and corrective action planning. Potential receptors are identified and surveyed/evaluated in the context of individual relevance and/or regulatory mandate or guidance.

1.3 SITE SURVEYS:

Physical surveys are utilized in the development of a horizontal and vertical project database. The data is often used to construct maps, to assist in making hydrogeologic determinations, and to aid in corrective action planning.

1.3.1 Horizontal Control:

Horizontal survey data is compiled using a possible combination of methods. Usually standard field and computational methods are employed. However, existing survey maps and/or photogrammetric techniques may be utilized, or a combination of existing data and field generated information may be used.

1.3.2 Vertical Control:

Vertical survey data is utilized primarily for establishing hydrogeologic control, and for evaluating topographic characteristics when necessary. The datum plane is generally assumed, except as otherwise noted. Assumed benchmarks are generally chosen to correspond with the approximate ground level, and vertical control is generally carried to an accuracy of \pm 0.01'.

1.4 DRILLING/HAND AUGERING AND MONITORING WELL/RECOVERY WELL/PIEZOMETER INSTALLATION:

Drilling, hand augering and subsurface installations are accomplished in accordance with site-specific requirements, regulatory requirements and feasibility considerations. The method employed at a specific site is tailored to the situation. Prior to any drilling or well construction activities, all necessary permits are obtained in accordance with federal, state and local requirements. All applicable licensing and bonding requirements are also fulfilled prior to beginning any work. Any boreholes purposely conducted at off-site locations are previously permitted through ingress/egress agreements with affected property owners or their agents.

1.4.1 <u>Drilling Methods:</u>

The following drilling methods are utilized:

1.4.1.1 Hand Augering:

Hand augering is commonly employed where economically, scientifically and/or situationally feasible. Hand augers typically produce 3" to 5" holes.

1.4.1.2 Auger Drilling:

Auger drilling is most often utilized in subsurface investigations. A truck or trailer mounted rig is usually employed and continuous five foot auger

Page 2 of 10

flights of varying configurations are used to produce the borehole. Sampling is often accomplished through hollow stem type augers. Auger selection is based on site-specific requirements.

1.4.1.3 Rotary Drilling:

Air or mud rotary drilling may be utilized for special applications where necessary or appropriate. Rotary drilling is usually preferred and often utilized for telescoping well installations.

1.4.1.4 Other Drilling Methods:

Other methods such as coring, cable tool, truck mounted bucket augering, hammer drilling, and reverse rotary are not commonly utilized except under special circumstances.

1.4.2 <u>Decontamination:</u>

Drilling tools are thoroughly cleaned between boreholes to prevent cross-contamination. Depending upon site-specific circumstances, cleaning methods may include steam cleaning, detergent wash, nitric acid rinsing and deionized water or analyte free water rinsing.

1.4.3 <u>Soil Sample Collection/Borehole Monitoring:</u>

Typically, soil samples are retrieved using a split-spoon device at five foot intervals. Cuttings and penetration rates are continuously monitored and additional samples are taken when appropriate. Grab samples may be obtained utilizing clean sampling equipment, new latex gloves, and are containerized in sealable plastic bags. The samples are then allowed to volatilize for approximately ten minutes prior to field screening. Composite samples may be obtained and a complete description of the collection procedure is recorded in the field book.

1.4.4 Well Installation:

Wells/piezometers are typically constructed utilizing threaded PVC casing and screen. Glues and cements are not used. Stainless steel or Teflon materials may also be used if site-specific conditions dictate.

Filter packs are selected to be compatible with screen slot characteristics. Bentonite is utilized to seal the borehole above the filter pack and grout is used to fill the remaining annulus. Well diameter and protective covers are chosen specific to site conditions. Well construction records are prepared from field notes. A well tag is affixed to the well head and includes the project name, driller's license number, borehole number, date of installation, total depth, casing depth, well diameter, screened, sand-, bentonite-, and grout-interval and static water level. The well is secured with a locking cap.

1.4.5 Well Development:

Under appropriate circumstances, wells are developed by overpumping, surging or bailing. Any contaminated development water is temporarily stored on-site for proper disposal. For large volumes of contaminated water, other site-specific arrangements may be made. Sampling is conducted a minimum of 24 hours following well installation and development.

1.4.6 Boring Logs:

All boreholes are logged for geological properties. Boring logs include the project name, hole number, date of boring and on-site geologist's name. Soil classification, soil description, relative wetness and photoionization detection readings are recorded for all split-spoon and grab samples obtained to total depth.

1.5 HYDROGEOLOGIC DATA:

Many methods are utilized for obtaining hydrogeologic data. Those methods most commonly utilized are as generally described below:

1.5.1 Regional Framework:

Information relating to the regional geological scope are generally compiled from existing published literature; however, previous technical reports, unpublished reports and personal communications with qualified Geologists may also be utilized.

1.5.2 Site Characteristics:

Most site information is generated through investigations on-site, although previous work proximal to the area of investigation may also be utilized. Borehole descriptions are important for making interpretations with respect to contacts, lithostratigraphic gradations, facies changes, fractures, faults, cleavage and diagenetic porosity and permeability modifications. Geophysical methods may also be employed.

1.5.3 Groundwater Measurements:

Groundwater measurements include physical and chemical qualitative and quantitative parameters. There are many procedures for making groundwater determinations in the field, including, but not limited to, those listed below:

1.5.3.1 Water Well Levels:

Water levels are primarily measured using precleaned probes or tapes in conjunction with water and gas finding pastes. Measurements are usually made to an accuracy of \pm 0.01'. products are measured and a specific gravity determination is made for each product type. A specific gravity adjustment is then used to calculate true hydraulic grade. Well measurements are combined with vertical survey data to calculate relative groundwater elevations. Transducers. bubbler lines or other methods may also be used under special circumstances to make water level measurements. All water level measuring equipment is decontaminated prior to measuring subsequent wells.

1.5.3.2 Aguifer Tests:

Various aquifer tests may be utilized to characterize aquifer parameters. These tests may include, but are not limited to, pumping tests, slug tests, recovery tests, tracer tests, specific capacity tests, laboratory permeability tests, sieve and pipette analyses and drawdown tests. Vertical gradients are usually characterized through nested well configurations. Other methods, including fracture tracing, geophysical logging and resistivity surveys may be utilized on a site-specific basis.

1.5.3.3 Chemical Data:

Chemical data may be field measured using organic analyzers, pH meters or litmus paper, specific conductance meters, thermometers or other equipment.

1.6 CONTAMINATION DATA:

1.6.1 <u>Collection Methods:</u>

Depending upon the nature of contamination, many methods are utilized to collect information. The following are the most commonly utilized methods; however, the list is not inclusive:

- 1.6.1.1 Direct thickness measurements of phase (gravity) separated components.
- 1.6.1.2 Laboratory analyses of free phase products.
- 1.6.1.3 Specific gravity measurements of free phase products.
- 1.6.1.4 Field vapor or headspace analysis.
- 1.6.1.5 Laboratory analysis of vapor, soil and groundwater.
- 1.6.1.6 Visual observations.
- 1.6.1.7 Field analytical procedures including: temperature, conductance, pH, etc.
- 1.6.1.8 Geophysical methods.

1.6.2 <u>Field Screening:</u>

Field screening of soil samples is performed to determine the extent of soil contamination and to help direct the placement of permanent monitoring wells by providing relative contamination levels. Freshly retrieved samples are containerized, sealed and allowed to volatilize for a brief period prior to monitoring. Vapor readings are obtained from headspace within the container. All field measurements are recorded and reported in relevant reports.

A photoionization detector (PID) is utilized to conduct field screening. The instrument is routinely calibrated for measuring the suspected contaminant by following the manufacturer's instructions to insure proper functioning of the PID. The calibration procedure involves utilizing a pressurized tank of a sample gas (benzene equivalent) of known concentration which should produce a projected reading at a given intake pressure. At the recommended pressure, the PID is adjusted to the manufacturer's specified reading.

1.6.3 Field Sampling for Laboratory Analyses:

Field sampling methods are generally in accordance with the 1986 EPA SOP and QA Manual and state guidance documents. Duplicate samples are obtained during all major site investigations. Rigorous cleaning procedures are adhered to and quality control blanks are utilized. All sampling equipment is thoroughly cleaned and rinsed between boreholes. Sample containers are new, laboratory-prepared and are never reused by field personnel. Chain of custody is documented throughout the sample handling process and included with all laboratory reports. State licensed laboratories will be utilized. Generally, sampling procedures are as follows:

1.6.3.1 Products:

Pure product samples are refrigerated and shipped to the analytical laboratory.

1.6.3.2 Soil:

Soil samples are obtained utilizing pre-cleaned equipment, and quickly containerized. Samples are then immediately refrigerated and shipped to the analytical laboratory.

1.6.3.3 Surface Water:

Grab samples are obtained with the sampler facing the upstream direction, if in a flowing body of water. Samples are refrigerated and shipped to the analytical laboratory.

1.6.3.4 Vapor:

Vapor samples are obtained utilizing either carbon

Page 7 of 10

tubes in conjunction with a calibrated pump, Tedlar bags, or by using a glass syringe. Samples are refrigerated and shipped to an analytical laboratory.

1.6.3.5 Water Supply Wells:

Water supply wells are difficult to properly purge and sample due to several factors including:

- A) availability of accurate construction records;
- B) inaccessibility;
- C) attached appurtenances such as tanks, treatment systems, etc.;
- D) agitation from pumping; and/or
- E) analyte-incompatible construction materials.

Generally, an attempt is made to obtain samples from as close to the wellhead as possible, and to completely purge the well and any attached equipment such as holding or pressure tanks. Also, prior to actual sample collection, flow is slowed to a trickle to minimize agitation. If possible, the sample is taken directly from the well using a bailer.

1.6.3.6 Monitoring Wells:

Monitoring wells are sampled according to a standard procedure, as follows:

- A) A total storage volume is calculated for each well.
- B) Three volumes are removed using a bailer or purging pump. If the well dries up during bailing, a minimum of one volume is removed.
- C) Samples are labeled.

- D) Samples are refrigerated and immediately preserved and/or containerized in accordance with protocol.
- E) Sampling records are completed.
- F) Chain of custody records are completed.
- G) A travel blank will be utilized. It will originate at the laboratory and will remain with all samples until returning to the laboratory.
- H) Samples are promptly shipped to the analytical laboratory.

1.7 CONSTRUCTION DATA:

Site conditions may warrant additional intrusions, excavations or construction to evaluate or remediate known or potential hazards at the site. All construction work will be conducted under the direct supervision of a senior technician or project manager. An as-built system survey will depict site constructions.

1.7.1 <u>Excavations:</u>

Access to excavations will be limited by use of traffic cones, lighted barricades, caution tape or some other apparatus. Open excavations will be backfilled promptly.

1.7.2 <u>Electrical Equipment:</u>

Choice of electrical equipment will be dependent on intended use and site-specific characteristics. Access to such equipment will be limited by the construction of a barricade or fenced enclosure.

1.7.3 <u>Health and Safety Plan:</u>

Personnel will carry a site-specific Health and Safety Plan to the site during every site visit.

2.0 <u>DATA COMPILATION/EVALUATION:</u>

Data is compiled and evaluated in accordance with generally accepted industry standards, which are summarized as follows:

2.1 BACKGROUND DATA:

Background information is utilized to develop an historical perspective relating to the identification of all potential sources or contributors.

2.2 RECEPTOR DATA:

Receptor information is evaluated with regard to the potential for past, current and future environmental impact.

2.3 SURVEY DATA:

Horizontal survey data is reduced and utilized in the development of site maps for use as a framework to provide a spacial context. Vertical survey data is utilized to provide a vertical datum for hydrogeologic and topographic characterizations. A licensed surveyor may be utilized to conduct the initial comprehensive survey and subsequent surveys may be conducted by the contractor.

2.4 DRILLING DATA:

Drilling information is compiled and presented in boring logs. The information is utilized for hydrogeologic characterizations.

2.5 - WELL CONSTRUCTION:

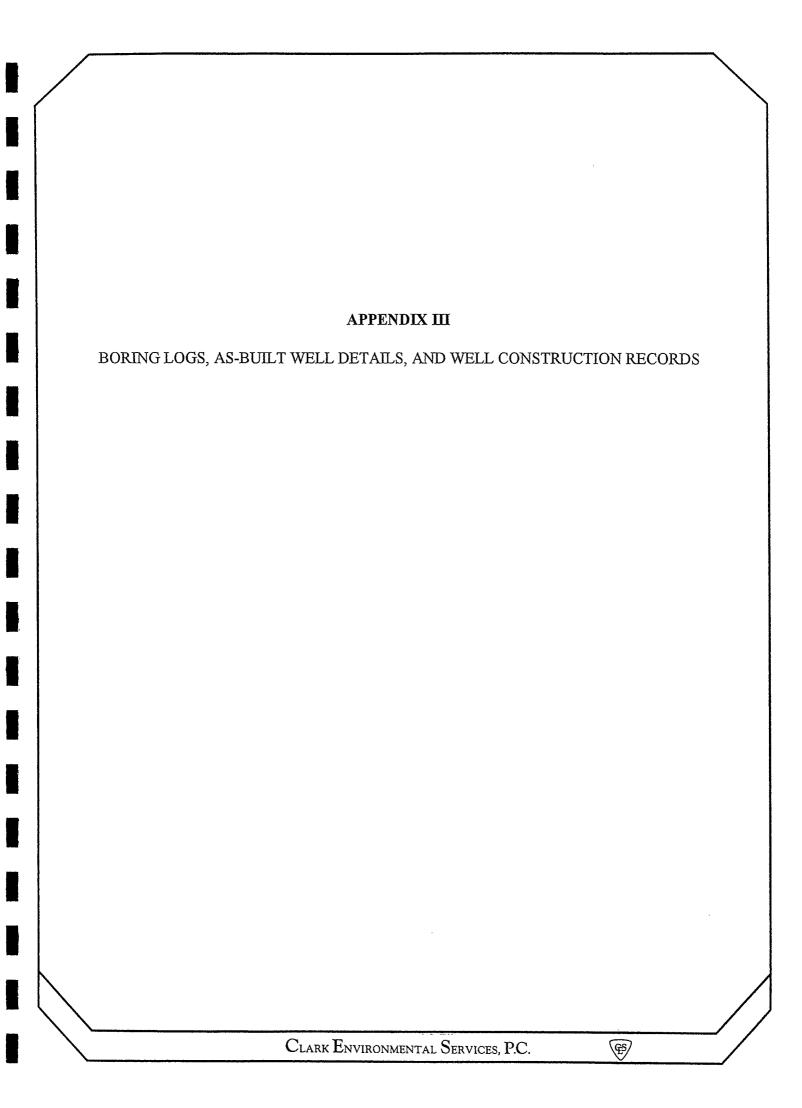
Well construction information is utilized in the development of as-built well details and/or other well construction records and evaluated in terms of depths and screen settings as they relate to hydrogeologic and contaminant characteristics.

2.6 CONTAMINATION/LABORATORY ANALYSES DATA:

Laboratory and other analyses data are utilized in the development of maps, calculations, models and other constructions and are used in developing and monitoring corrective actions.

2.7 GEOLOGICAL/HYDROGEOLOGICAL DATA:

Geological and hydrogeological data are used for developing maps, calculations and other constructions as they relate to making characterizations and developing and monitoring corrective actions.



PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: MW1 DATE: 10/17/02

LOGGED BY: J. Shadroui

DEI	PTH:		PID VAPOR	SURVEY
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	1.0	Orange tan medium to fine SAND, slightly damp	Moderate ammonia	NM
1.0	2.0	Orange tan medium to fine sand grades to a pinkish silty fine SAND, damp	No	NM
2.0	3.0	Orangish tan silty fine SAND, mixed with mottles of tannish orange silty fine SAND, grades to very damp	No	NM
3.0	4.0	Pinkish tan and brownish gray silty fine SAND, becomes slightly clayey, wet	Strong ammonia	NM
4.0	5.0	Pinkish tan very silty fine SAND, slightly clayey, wet	Strong ammonia	NM
5.0	6.0	Medium dark pinkish gray very fine sandy, clayey SILT grades to a pinkish gray CLAY, locally mottled with orange/rusty zones	Strong ammonia	NM
6.0	7.0	Dark pinkish brown slightly silty CLAY with dark brownish black and rusty orange mottles (very tight hard clay), wet	Strong ammonia	NM
7.0	8.0	Dark gray, pinkish gray and blackish gray slightly silty CLAY with orange mottles, wet tight clay	Strong ammonia	NM
8.0	9.0	Dark pinkish brown clayey SILT with localized "pods" of distinct gray and orange clayey zones	Moderate ammonia	NM
9.0	10.0	Pinkish gray, pinkish brown and dark brown intermixed silty CLAY with lighter gray fine silty SAND lenses	Moderate ammonia	NM
10.0	11.0	Pinkish gray and light gray silty CLAY with abundant fine sandy lenses and burrows, grades to gray silty SAND, wet	Strong ammonia	NM
11.0	12.0	Light gray and white silty fine grained SAND bed, wet	Minor ammonia	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: MW2 DATE: 11/04/02 LOGGED BY: M. Tate

DE	PTH		PID VAPOR	, SURVEY
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	2.0	Grass/roots, orangish brown fine SAND, very slightly clayey	No	NM
2.0	4.0	Orange/tan, very sandy CLAY, fine to medium grained, very damp, split spoon	No	NM
4.0	6.0	Intermixed tan/orange, very sandy CLAY, wet	No	NM
6.0	8.0	Orange/gray tight CLAY with a trace of medium grained SAND, split spoon	No	NM
8.0	10.0	Orange/gray tight CLAY with a trace of medium grained SAND, wet	No	NM
10.0	12.0	Orange/brown CLAY to 12' then sudden contact to white very fine SAND, split spoon	No	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) 4) NM represents not measured
- PID represents photoionization detector



PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: MW3 DATE: 11/04/02

LOGGED BY: J. Shadroui

DEI	PTH		PID VAPOR	SURVEY
FROM (ft BGS)	TO (ft.BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	2.0	Grass/roots, organic SAND, brown/orange fine SAND	No	NM
2.0	4.0	Orangish-tan and gray fine grained SAND, slight clay content, split spoon	No	NM
4.0	6.0	Orangish-tan and gray fine grained SAND, slight clay content, wet	No	NM
6.0	8.0	No recovery in spoon, but outside smear showed dark brown CLAY, slightly sandy, split spoon	No	NM
8.0	10.0	Dark brown CLAY, with increasing silt, very fine sand content	No	NM
10.0	12.0	Dark brown CLAY to 10.5' then wood debris followed by sharp contact to white very fine SAND at 11.0', split spoon	No	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: MW4 DATE: 11/11/02 LOGGED BY: M. Tate

	PTH		PID VAPOF	SURVEY
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	2.0	Grass/roots, tan to medium brown silty fine SAND with trace clay	No	NM
2.0	4.0	Orangish brown very fine silty SAND with increasing clay content	No	NM
4.0	6.0	Orangish brown very fine silty SAND to 4.25' then orange and brown mottled clay with moderate sand content, split spoon	No	NM
6.0	8.0	Orangish brown very sandy CLAY	No	NM
8.0	10.0	Orangish brown very sandy CLAY	No	NM
10.0	12.0	Orange/brown mottled sandy CLAY to 11.5 then red 50/50 clay/medium sand mix, split spoon	No	NM

- 1) ppm represents parts per million
- 2) 3) ft BGS represents feet below ground surface
- NM represents not measured
- 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: MW5 DATE: 11/11/02 LOGGED BY: M. Tate

DEPTH			PID VAPO	R SURVEY
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	2.0	Grass/roots medium grayish brown very fine SAND, slightly clayey	No	NM
2.0	4.0	Orangish tan very fine SAND, clayey, wet	No	NM
4.0	6.0	Very fine orangish tan SAND to 4.25' then medium brown and orange mottled CLAY with sand, split spoon	No	NM
6.0	8.0	Orange/brown sandy CLAY	No	NM
8.0	10.0	Orange/brown sandy CLAY	No	NM
10.0	12.0	Brown CLAY, slightly sandy to 11.5' then red and gray very silty CLAY, sandy at bottom, split spoon	No	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector



PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: MW6 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEP	TH		PID VAPO	R SURVEY
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION:	ODOR	READING (ppm)
0	2	Grass, pine straw, roots; then light yellowish tan very fine SAND	No	NM
2	4	Light yellowish tan very fine SAND; then light yellowish tan very fine SAND interlayered with orange slightly clayey fine SAND	No	NM
4	6	Orange and tannish gray mottled sandy CLAY, wet	No	NM
6	8	Orange and gray mottled slightly sandy CLAY, wet	No	NM
8	10	Brownish gray slightly sandy CLAY, wet	No	NM
10	12	Brownish gray slightly sandy CLAY intermixed with bright yellowish orange silty CLAY, wet	No	NM
,				

- ppm represents parts per million 1)
- ft BGS represents feet below ground surface 2)
- 3) 4) NM represents not measured
- PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: DW1 DATE: 11/13/02 LOGGED BY: M. Tate

DE	PTH		PID VAPO	R SURVEY
FROM (ft BGS)	TO (ft:BGS)	DESCRIPTION	ODOR	READING (ppm)
0.0	2.0	Grass/roots, tan to medium brown silty fine SAND with trace clay	No	NM
2.0	4.0	Orangish brown very fine silty SAND with increasing clay content	No	NM
4.0	6.0	Orangish brown very fine silty SAND to 4.25' then orange and brown mottled clay with moderate sand content, split spoon	No	NM
6.0	8.0	Orangish brown very sandy CLAY	No	NM
8.0	10.0	Orangish brown very sandy CLAY	No	NM
10.0	12.0	Orange/brown mottled sandy CLAY to 11.5 then red 50/50 clay/medium sand mix, split spoon	No	NM
12.0	14.0	Tan silty CLAY to 12.5' then orange SILT with clay and fine grained SAND, wet, split spoon	No	NM
14.0	18.0	Orange SILT, slight clay content	No	NM
18.0	20.0	Tan silty CLAY (0.5') then gray 50/50 SILT/CLAY mix, split spoon	No	NM
23.0	25.0	Tan/orange/gray very silty CLAY, split spoon	No	NM
				,
				····

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- NM represents not measured
- 3) 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: DW2 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEP	TH.		PID VAPO	OR SURVEY
FROM (ft BGS) «	TO (ft.BGS)	DESCRIPTION	ODOR	READING (ppm)
0	12	See boring log for MW1	NA	NM
12	14	Very light grayish tan silty, slightly clayey, very fine SAND	No	NM
14	16	Orange to gray slightly clayey SILT with root fragments, split spoon	Strong	NM
16	18	Dark gray very silty CLAY, wet	No	NM
18	20	Orange to tan SILT, wet, split spoon	No	NM
20	23	Orange SILT with some tan mottling	No	NM
23	25	Orange SILT with some tan mottling to 24.75 ft.; then darker orange SILT with coarsening SAND content, split spoon	No	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- NM represents not measured
- 3) 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: SB1 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEPTH			PID VAPOR SURVEY	
FROM (fi BGS)	TO (ft BGS)	DESCRIPTION	ODOR	RÉADING (ppm)
0	1	Orangish brown fine SAND, moist	No	NM
1	2	Light tannish gray silty fine SAND, wet	Faint	NM
2	3	Light tannish gray silty fine SAND, wet	No	NM
3	4	Gray slightly clayey, silty, fine SAND	No	NM
4	5	Gray slightly clayey, silty, fine SAND	Moderate	NM

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: SB2 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEF	TH		PID VAPO	R SURVEY
FROM (ft BGS)	TO (ft.BGS)	DESCRIPTION	ODOR	READING (ppm)
0	1	Grass; then orange fine SAND	No	NM
11	2	Light tannish orange fine SAND, very moist	No	NM
2	3	Light tannish orange fine SAND; then gray fine SAND, very wet	No	NM
3	4	Brownish gray silty fine SAND, wet	No	NM
4	5	Brownish gray silty fine SAND, wet	No	NM

NOTES:

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

(ES)

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: SB3 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEF	TH			PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)	
0	1	Grass; then tan fine SAND, moist	No	NM	
1	2	Tan very fine SAND, very moist	No	NM	
2	3	Dark brown, slightly clayey, silty SAND, wet	No	NM	
3	4	Brownish gray slightly clayey, silty SAND, wet	No	NM	
4	5	Gray silty fine SAND	No	NM	
			<u> </u>		

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: SB4 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEF FROM (ft BGS)	TO	DESCRIPTION	ODOR	OR SURVEY READING (ppm)
0	1	Grass; then orange fine SAND	No	NM
1	2	Light tannish orange fine SAND, very moist	No	NM
2	3	Light tannish orange fine SAND; then gray fine SAND, very wet	No	NM
3	4	Brownish gray silty fine SAND, wet	No	NM
4	5	Brownish gray silty fine SAND, wet	Moderate	NM

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: SB5 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEPTH			PID VAPOR SURVEY	
FROM (ft BGS)	TO (ft BGS)	DESCRIPTION	ODOR	READING (ppm)
0	1	Grass; then tan fine SAND, moist	No	NM
1	2	Tan very fine SAND, very moist	No	NM
2	3	Dark brown, slightly clayey, silty SAND, very moist	No	NM
3	4	Brownish gray slightly clayey, silty SAND, wet	No	NM
4	5	Gray silty fine SAND	No	NM

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: SB6 DATE: 12/12/02

LOGGED BY: W. M. Tate

DEF FROM (ft. BGS)				
0	1	Grass; then orange fine SAND		NM
1	2	Light tannish orange fine SAND, very moist	No	NM
2	3	Light tannish orange fine SAND; then gray fine SAND, very moist	No	NM
3	4	Dark brown clayey very silty SAND, wet	No	NM
4	5	Dark brown clayey very silty SAND, wet	Moderate	NM

NOTES:

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

(FS)

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 WELL NO: SB7 DATE: 12/12/02

LOGGED BY: W. M. Tate

FROM	ТН ТО	ĎESCRIPTION	PID VAPO	OR SURVEY READING
(ft BGS)	(ft BGS)	<u>an all le montagnes at as en en al autori</u>		(ppm)
0	1	Grass; then tan fine SAND, moist	No	NM
1	2	Tan very fine SAND, very moist	No	NM
2	3	Dark brown, slightly clayey, silty SAND, moist	Moderate	NM
3	4	Brownish gray slightly clayey, silty SAND, wet	No	NM
4	5	Brown fine clayey SAND, wet	Slight Ammonia	NM

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141

WELL NO: SB8 DATE: 12/12/02

LOGGED BY: W. M. Tate

DER FRÖM: (ft.BGS)	TH TO (ft BGS)	DESCRIPTION	ODOR	OR SURVEY READING (ppm)
0	2	Tan to bright reddish orange fine silty SAND, very moist	Slight	NM
2	3	Tan to bright reddish orange fine silty SAND; then medium brown fine clayey SAND, wet	Strong	NM
3	4	Medium brown fine clayey SAND mottled with gray fine silty clayey SAND, wet	Slight	NM
4	5	Medium brown fine clayey SAND mottled with gray fine silty clayey SAND, wet	No	NM

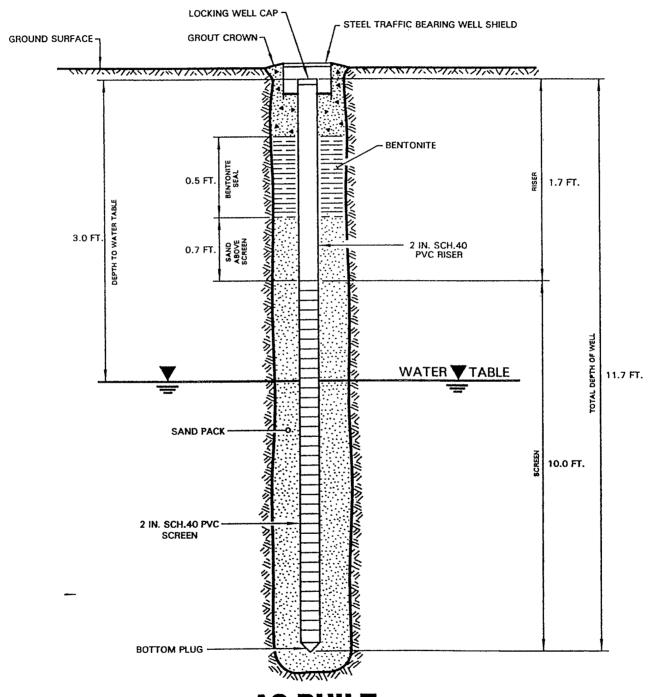
NOTES:

- 1) ppm represents parts per million
- 2) ft BGS represents feet below ground surface
- 3) NM represents not measured
- 4) PID represents photoionization detector

(F)

TABOR CITY, NC CES PROJECT NO. 02141





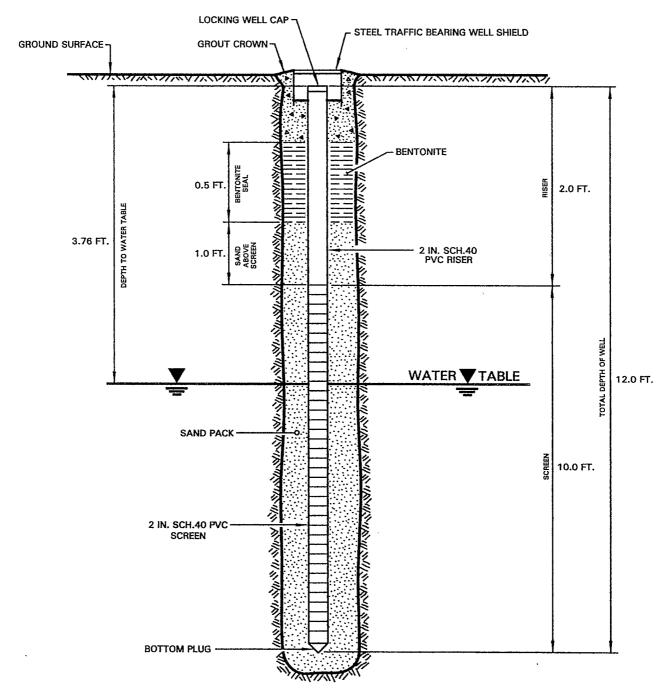
AS-BUILT
WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141

MW2



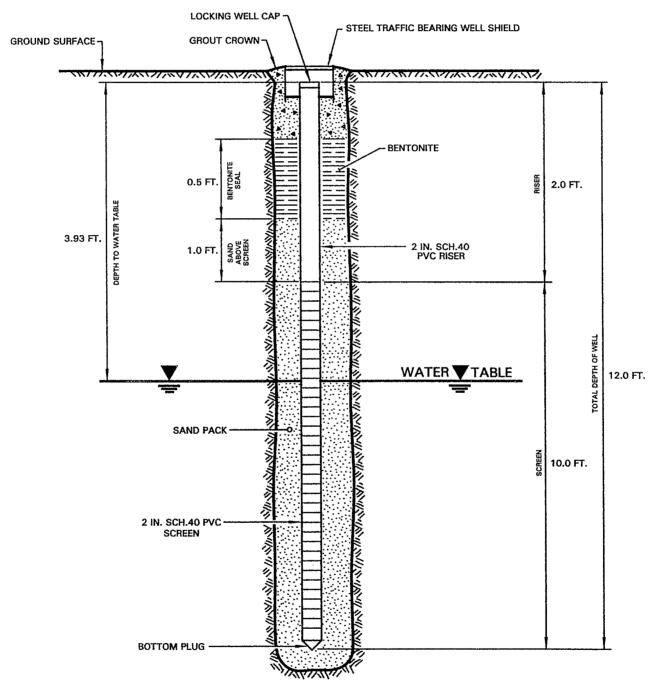
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141





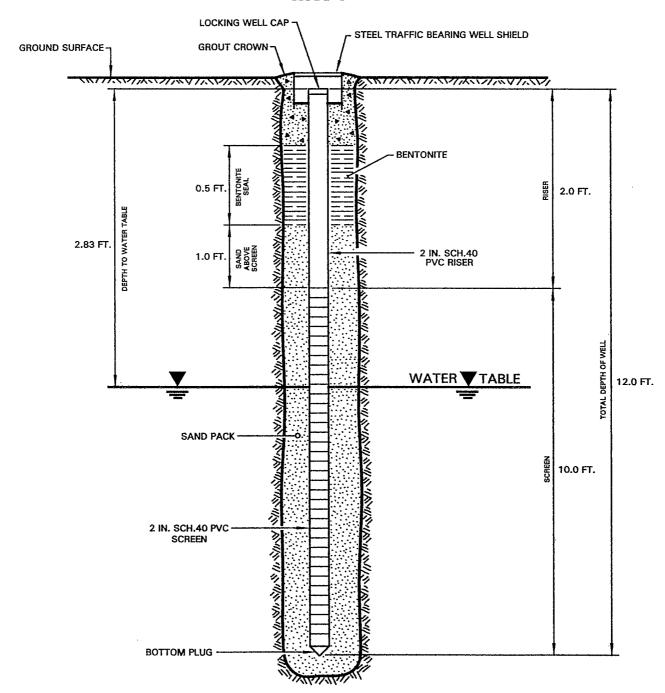
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

(FS)

TABOR CITY, NC CES PROJECT NO. 02141

MW4



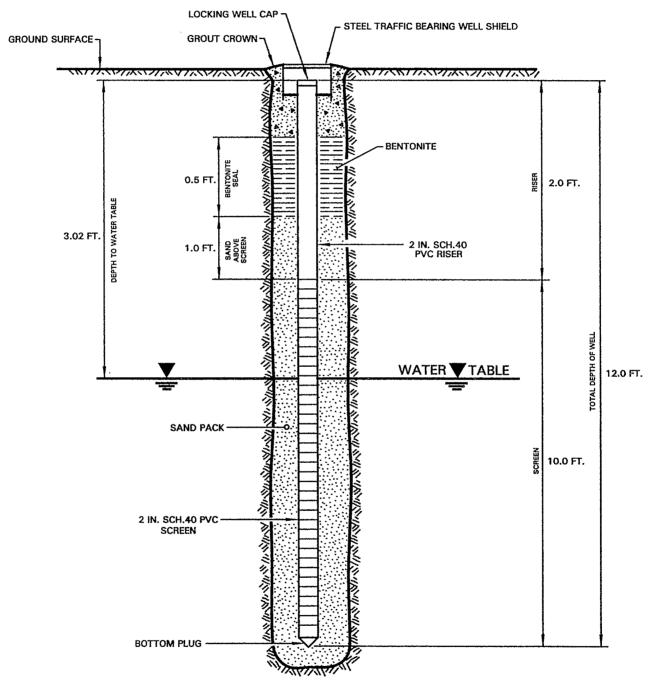
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141

MW₅



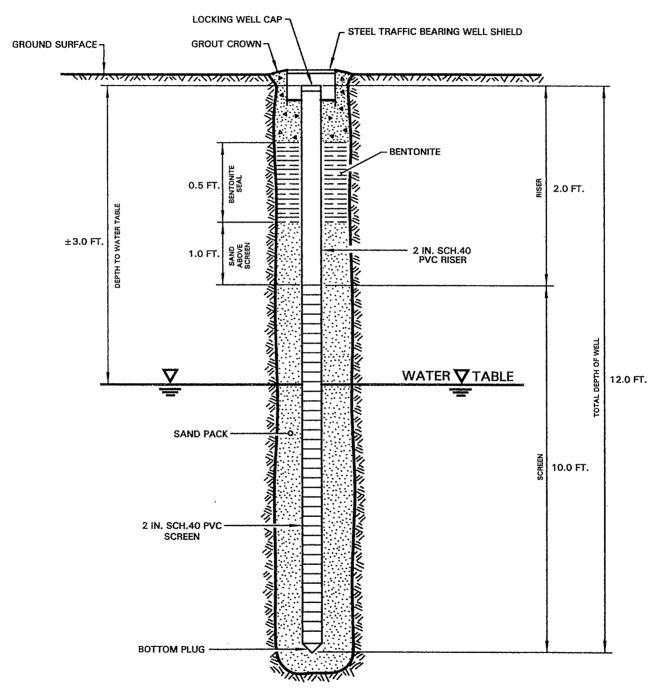
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141

MW6



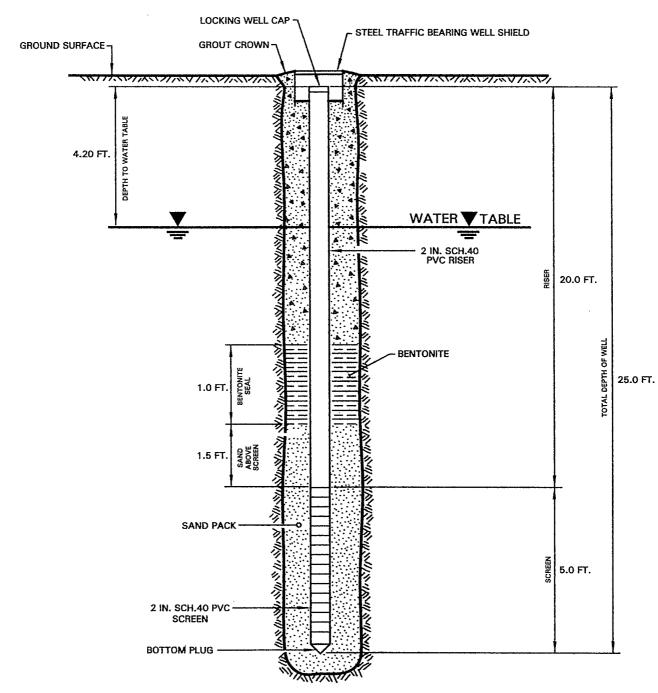
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141

DW1



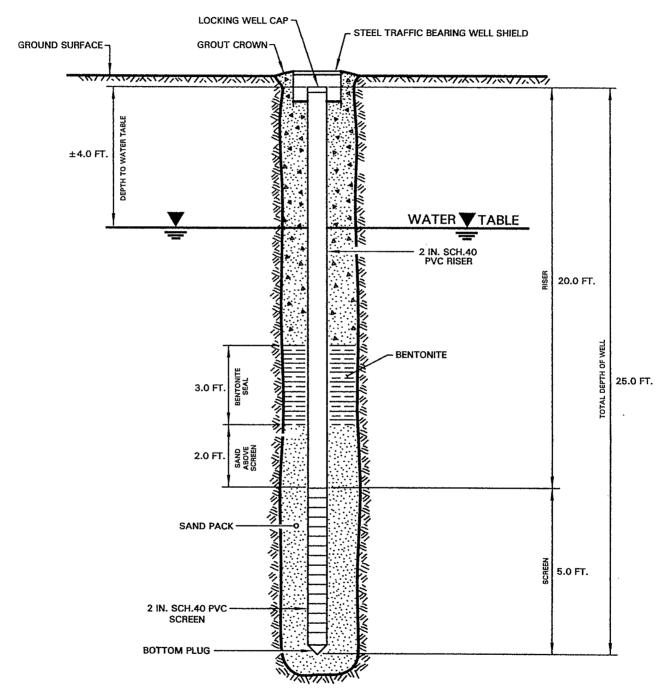
AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE



TABOR CITY, NC CES PROJECT NO. 02141

DW₂



AS-BUILT MONITORING WELL DETAIL

NOT TO SCALE

mW1 WELL CONSTRUCTION RECORD North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section WELL CONTRACTOR (INDIVIDUAL) NAME (print) JOANNE Shadroui _ certification / 2067 WELL CONTRACTOR COMPANY NAME CLOCK Environmental Services P.C. PHONE # (910) 602-3900 ASSOCIATED WO PERMIT# STATE WELL CONSTRUCTION PERMITM (if applicable) (if applicable) 1. WELL USE (Check Applicable Box): Residential Municipal/Public Industrial Agricultural Monitoring & Recovery A Heat Pump Water Injection Other Is If Other, List Use_ 2. WELL LOCATION: Topographic/Land setting County Columbus Nearest Town: Tabor ORidge OSlope OValley OFlat 1007 Pireway Tabor City (check appropriate box) (Street Name, Numbers, Community, Subdivision, Lot No., Zip-Pode) Latitude/longitude of well location 34° 8' 17" 78° 51' 55" 3. OWNER: Mr. Donald Watson (degrees/minutes/seconds) Pireway Latitude/longitude source: GPS Topographic map Address 1007 (check box) (Street or Route No.) DEPTH DRILLING LOG From Formation Description Zin Code City or Town (410)-653-2836 Area code- Phone number 4. DATE DRILLED 10/17/0→ 5 TOTAL DEPTH. __ 11.7 6 DOES WELL REPLACE EXISTING WELL? YES □ NO □ 7 STATIC WATER LEVEL Below Top of Casing: 3 (Use "+" if Above Top of Casing) 8. TOP OF CASING IS ____ FT. Above Land Surface* *Top of casing terminated at/or below land surface requires a 9. YIELD (gpm): WA METHOD OF TEST 10. WATER ZONES (depth): Surticial aguiter LOCATION SKETCH Show direction and distance in miles from at least 11 DISINFECTION Type, NA Amount NT two State Roads or County Roads. Include the road 12 CASING: Wall Thickness numbers and common road names. or Weight/Ft. Materia Diameter Depth To_[.] <u>5CH 40</u> To____ From_ To____ Depth Mcthod 13. GROUT: Material To 0.5 See attached in-place From_O FL neat cement From 0.5 1n-plac To 1.0 Fr. bentonite SCREEN: Depth Diameter To 11.7 Ft. 2 in. 0,010 in. From 1 From To_ 15. SAND/GRAVEL PACK:

16. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER

Material

Size

FL COAPSE

Depth To_11.7

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD MW2

North Carolina - Department of Environment and Natural Resources -	CERTIFICATION & 322
WELL CONTRACTOR (INDIVIDUAL) NAME (PRINT) FRANK BEE	1 Secvices PC move + Alo 1002-200
	(if applicable)
(if applicable)	(ii applicatio)
WELL USE (Check Applicable Box) Residential [] Municipal/Monitoring [] Recovery [] Heat Pump Water Injection [] C	Public Industrial Agricultural Other, List Use
Nearcst Town: Tabor City County Columbus 1007 Pireway Road Tabor City, NC (Street Name, Numbers, Community, Subdivision, Lot No. 2 ipt ock)	Topographic/Land setting Ridge Slope Valley State (check appropriate box) Latitude/longitude of well location
OWNER: MV. Dorald Watson. Address 1007 Pireway Road	\(\begin{align*} \frac{\mathbb{N34\circ}{\sigma}\frac{\mathbb{N}}{\sig
Tabor City NC 28463	(check box) <u>DEPTH</u> <u>DRILLING LOG</u>
City or Town State Zip Cote	From To Formation Description
()-	
Area code- Phone number	
TOTAL DEPTH: 12'	
DOES WELL REPLACE LISTING WELL TO RECEIVE SO DE	See attached
STATIC WATER LEVEL Below Top of Carry 3 🔧 🔧 17	Jee anadio
TOP OF CASING IS O.O. F1. Above Land Surface?	
Top of casing terminated attor below land surface requires a	
variance.in accordance with 15A NCAC 2C .0118.	
YIELD (gpm): NA METHOD OF JUST NA	.,
WATER ZONES (depth): Surficial Aguiter	LOCATION SKETCH
DISINFECTION Type NA Amount NA	Show direction and distance in miles from at least
DISINFECTION Type UA Amount NA CASING	Two State Roads or County Roads. Include the conf-
Depth Diameter a Weight 1 Materjai	numbers and common road names
From O To 2 F1 2" SCHLYO PVC	
From To Ft.	
FromToFt	
GROUT: Depth Material Method	
From O Too.5 Fr Concrete in-place	See affected
From 0.5 To 1:0 Ft. Bentonte in-place	See universes
SCREEN: Denti Diameter Stot Size Material From 3 10 18 Ft. 3 in 0.010 in PVC	A SANSAN AND AND AND AND AND AND AND AND AND A
From Fo Ft in in	•
SAND/GRAVEL PACK:	
Depth Size Material	
From 1 To 12 Fr. Coarse Sand	
From To Ft.	•
REMARKS:	
O HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN A	
ONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD	HAS BEEN PROVIDED TO THE WELL, OWNER
-hand Beacher	12.4.02
SIGNATURE OF PERSON CONSTRUCT	

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD MW3

North Carolina - Department of Environment and Natural Resources WELL CONTRACTOR (INDIVIDUAL) NAME (print) Frank Belche WELL CONTRACTOR COMPANY NAME CLARK ENVIRONMENTAL STATE WELL CONSTRUCTION PERMITAL ASS.	Division of Water Quality - Groundwater Section CERTIFICATION # 3-255
WELL CONTRACTOR COMPANY NAME CLARK Environmental	Services, P.C. PHONE & Aloj LO2-3400
STATE WELL, CONSTRUCTION PERMIT#ASS	SOCIATED WQ PERMIT# (if applicable)
WELL USE (Check Applicable Box): Residential ☐ Municipal/ Monitoring ☐ Recovery ☐ Heat Pump Water Injection ☐ €	Public [] Industrial [] Agricultural [] Other [] If Other, List Use
2. WELL LOCATION: Nearest Town: Tabor City County Columbus 1007 Pirtury Road Tabor City, NC (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)	Fopographic/Land setting ORidge OSlope OValley OFlat (check appropriate box) Latitude/longitude of well location (1:34°C8'24" W:78°53'03"
OWNER Mr. Donald Watson Address 1007 Pireway Road	(depressiminutes seconds) Latitudes longitude source: GPSG Topographic map (check box)
Tabor City NC 28463 Unit of Town State Zip Code	DLPTH DRILLING LOG Formation Description
4 DATE DRILLED 11-4-08 5 LOTAL DUPTH [2]	
・ DOES WITT PEPEACE EXISTING WELLで AFS [1 See lef STATE WATER LEVEL Below Top of Casing 多分章 LE (Use "+" if Above Top of Casing)	Cee attached
** Int' (I) (ASING IS O.O. FT. Above Land Surface' **Inp of casing terminated allor below land surface requires a **sariance in accordance with 15A NCAC 2C.0118.	
9 YILLD (gpm): NA METHOD OF TEST NA 10 WATER ZONE'S (depth): Surficial Aguite.	LOXIATION SKETCH
DEPTH Diameter or Weight 1 Material From O To 2 Ft. 2" SCH 40 PYC	Show direction and distance in miles from at least two processes of county Roads. Include the road managers and common road names.
from fo Etc.	
From 0 Fo 0.5 Ft concrete in-place From 0.5 To 1.0 to Bentonite in-place	See attached
From 2 To Pto in OOO in PV Communication of the Pto in	
IS SAND/GRAVEL PACK: Depth Size Material	
From To To Coarse Sand	
16 REMARKS:	the second of th
I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN A CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD	CCORDANCE WITH 15A NCAC 2C, WELL DHAS BEEN PROVIDED TO THE WELL OWNER
Lah Beecher	INGTHE WELL DATE

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV, 07/2001

WELL CONSTRUCTION RECORD

MWY

	TOD COMPANY NAME	Clark Environment	tal Services P.C.	CERTIFICATION # 322 PHONE # (910) 602-390
STATE WELL CO				
WELL USE	(Check Applicable Box) Recovery 🛭 Heat I	: Residential □ 'Munici Pump Water Inj∝tion □	ipal/Public [] Industrial (Other [] If Other, List (☐ Agricultural ☐ Jsc
1007 Pir	1: Tabor City	County Columbus City, NC ion, Loi No., Zip Code)	□Ridge □S (chec	nphic/Land setting lope
Address 10	ium State	00d 28463 Zip Code		es/ininutes/seconds) urce: GPS Topographic ma (check box) <u>DRILLING LOG</u> Formation Description
Area code- Phon DATE DRIL TOTAL DEP DOES WELL	LED <u>II </u>			Φ
S TOP OF CAS *Top of casing variance in acc 9. YIELD (gpm	(Use SING IS OO FT terminated alor below land ordance with 15A NCAC 20):	"+" if Above Top of Casing) C. Above Land Surface " surface requires a C.0118. OF TEST		
1 DISINFECTI 2 CASING	ON Type N4- Depth Diamet		Show direction and o two State Roads or C mal numbers and commo	ION SKETCH distance in miles from at least founty Roads. Include the road in road names.
From	ToFt		5E E	TACHED
GROUT: From 0.5 From 0.0	Depth Mat To 1 Ft. Bis To ON Ft. Co	icial Metho finite In-P	d loce	्र इंस २०१४ -
4. SCREEN: From Z From SAND/GRAY		in: in		
from <u>l</u> From	Depth Size To 1Z Ft Control To Ft.	Material Sand		
6 REMARKS:	RTIFY THAT THIS WEE	GWAS CONSTRUCTED I	N ACCORDANCE WITH 15	A NCAC 2C, WELL
		T'A COPY OF THIS REC		

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD MWS

Taker City NC 28443	(If applicable) blic Industrial cr If Other, List Use Topograph Ridge Slop (check a) Latitude/longit	
Monitoring Recovery Heat Pump Water Injection Other 2. WELL LOCATION: Nearest Town: Tabor City County Columbus 1007 Pireway Road Tabor City NC (Street Name, Numbers, Community, Subdivision, Lot No., 71p Code) 3. OWNER: Mr Donald Watson Address O 7 Pireway Road L Tabor City NC Street or Route No.) Tabor City NC 28443 City or Town Stake Zap Code (912). 653-2834 Area code Phone number 4 DATE DRILLED 1/11/02 5 FOTAL DEPTH 12 FT 6 DOES WILL REPLACE EXISTING WELL 1981 NO. 20	Topograph Gridge Gslop (check a) Latitude/longit degræs/ii atitude/longitude source	ic/Land setting c
Nearest Town: Tabor City County Columbus 1007 Pireway Road Tabor City NC (Street Name, Numbers, Community, Subdivision, Lot No., 78p Cock) 3. OWNER: Mr Donald Watson Address 1007 Pireway Road L Tabor City NC 28443 City or Town Stake Zap Code (912). 653-2836 Area cock Phone number 4 DATE DRILLED 11/11/02 5 FOTAL DEPTH 12 FT 6 DOLS WILL REPLACE EXISTING WELL 1951 NO 20	□Ridge □Slop (check aj Latitude/longit (degræs/ii atitude/longitude source DEPTH	oc OValley OFfat sympriate box) ude of well location sinutes/seconds) e: OGPSOTopographic map (check box) DRILLING LOG
Address 1007 Pireway Road L Tahor City NC 28443 City of Town State Zip Code (910). 653-2836 Area code Phone number 4 DATE DRILLED 11/11/02 5 FOTAL DEPTH 12 FT 6 DOLS WILL REPLACE EXISTING WELL 1981 NO 20	_atitude/longitude sourc	e: OGPS OT opographic map (check box) DRILLING LOG
Area code Phone number 4 DATE DRILLED 1/11/02 5 FOTAL DEPTH /2 FT 6 DOES WITH REPLACE EXISTING WELL! YEST NO M	-	
(lise "" if Above Top of Casing	BLC ATTACHED	- · · · · ·
*Top of casing terminated abor below land surface requires a variance in accordance with 15A NCAC 2C.0118.	* *************************************	
2 CASING Wall Thickness to Depth Diameter of Weight-1 Material From O To Z Ft. Z" Sch 40 PVC	Show direction and dist	N SKETCH nace in miles from at least ony Roads Include the road oad names
From To Ft. From To Ft. GROUT: Depth Material Method From O To O. 5 Ft. Concrete In-Place	SEE ATTAC	HED
From 0.5 To 1 Ft. Bentwife In-Mace 4 SCREEN: Depth Diameter Slot Size Material From 2 To 12 Ft. 2 in 0.000 in PUC From To Ft. in in		<u>.</u>
SAND/GRAVEL PACK Depth Size Material From 1 To 12 FL Conse (#2) PUC From To Ft.		19 4 18 4 19 6
REMARKS:		

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV, 07/2004

WELL CONSTRUCTION RECORD MW6

ATE WELL CONSTRUCTION PERMIT# NA AS (if applicable)	SOCIATED WQ PERMIT# (if applicable)	
WELL USE (Check Applicable Box): Residential ☐ Municipal Monitoring 🌣 Recovery ☐ Heat Pump Water Injection ☐ C	/Public Industrial Dother If Other, List Use	Agricultural 🗆
WELL LOCATION: Nearest Town: Tabor City County Columbus 1007 Pireway Road Tuber City, NC (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)	□Ridge □Slope (check ap Latitude/longitu	ic/Land setting C DValley MFlat propriate box) Ide of well location W 78 51 55 "
OWNER: Mr. Donald Watson	(dctaces/1u	inutes/seconds)
Address 1007 Pireway Road	Latitude/longitude source	::□GPSDTopographic ma
(Street or Route No.)	DEPTH	(check box) <u>DRILLING LOG</u>
Tubor City NC City or Town State Zip (ode (910) - 653 - 2836	From To	Formation Description
(910)-653-2836		***************************************
Arra code, Phone number		
DATE DRILLED 12/12/02 TOTAL DEPTH: 12 FT		
DOES WELL REPLACE EXISTING WELL YES DINO X	<u>58</u>	ATTACHED
STATIC WATER LEVEL Below Top of Casing. = 3 17		ninginge
(Use "+" if Above Top of Casing) TOP OF CASING IS O.O FT. Above Land Surface* *Top of casing terminated attor below land surface requires a		
variance in accordance with 15A NCAC 2C .0118.		
YIELD (gpm): <u>NA</u> METHOD OF TEST <u>NA</u> WATER ZONES (depth): <u>Surficial</u> Aqvifur.		
DISINFECTION Type NA Amount NA CASING: Wall thickness Depth Diameter or Weight 1 Material From O To 2 Ft 2" Sch 40 PVC	Show direction and dista	N SKETCH name in miles from at least at the Roads Include the road and names
From To Ft From To Ft Material Method		
From 0 To 0.5 Ft Concrete In-Place		ATTACHED
From 0.5 To 1 Ft Berten te In-Phase SCREEN: Depth Diameter Slot Size Material	.	
From 2 To 12 Ft. 2" in. 0.010 in PVC		
From To Ft. in. in		
SAND/GRAVEL PAC'K.		
From 1 To 17 Ft Charge (#2) Same		
From To 72 F(Charse (*2) Same (*2) From To Ft		
riomiori		
REMARKS:		

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD DWI

STATE WELL CONSTRUCTION PE (if applicable)		•	Q PERMIT#	PHONE # [910] 602-3400
WELL USE (Check Applicate Monitoring ☑ Recovery □	ole Box): Residential 🗍 Mu Heat Pump Water Injection	nicipal/Public 🗆	Industrial [] Other, List Us	Agricultural 🛘
(Street Name, Numbers, Community	ad Tabor City NC., Subdivision, Loi No., Zip Code)		Ridge DSlo (check)	hic/Land setting pc
OWNER: MV. Donald Address 1007 Pireu Tabor City Surect or Roun	My Road	Latitude/lo DEP	ongitude sour	ininutes/seconds) ce: GPS Topographic map (check box)
(910). 653-2836	Zip Code	From	To	DRILLING LOG Formation Description
4 DATE DRILLED 11/13/02 5 TOTAL DEPTH 25 FT 6 DOES WELL REPLACE LX	** ** ** * * * * * * * * * * * * * * *	 () (8		
7 STATIC WATER LEVEL Be	low Top of Casing. 4,20	FT ,	c }	
*Top of casing terminated after be variance in accordance with 15A h	CAC 2C .011%	**************************************		
). YIELD (gpm)M) WATER ZONES (depth):			LOCATIO	ON SKETCH
? CASING. Depth From <u>さ</u> To <u>なり</u> Fi.	2" Sch 40 1	two State	ction and dist	tance in miles from at least onty Roads. Include the road
From	Material Me	thod	SEE ATTALNED	
From 20 To 25 Ft.	Benforite In-P Diameter StorSize Ma Z in 0.010 in P	Ince		
SAND/GRAVEL PACK: Depth	Size Material			
FromToFt. REMARKS:				
O HEREBY CERTIFY THAT THE PASTRUCTION STANDARDS, AN	S WELL WAS CONSTRUCTED THAT A COPY OF THIS RI	D IN ACCORDANCE	E WITH 15A N PROVIDED 11	CAC 2C, WELL OTHE WELL OWNER
Jank Beech				

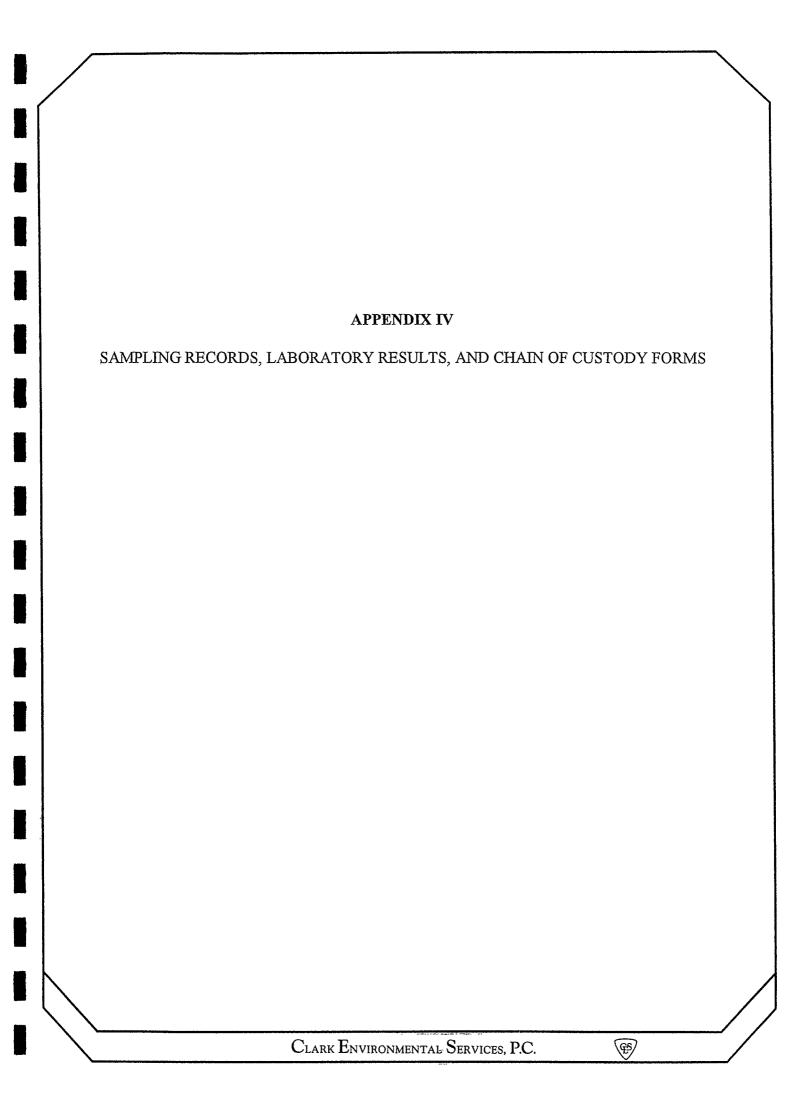
Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days.

GW-1 REV. 07/2001

WELL CONSTRUCTION RECORD DW2

WELL CONTRACTOR COMPANY NAME Clark Environmental STATE WELL CONSTRUCTION PERMITS WA ASS (if applicable)		
WELL USE (Check Applicable Box): Residential □ Municipal/ Monitoring Recovery □ Heat Pump Water Injection □ □	Public Industrial Other If Other, List	☐ Agricultural ☐ Use
2. WELL LOCATION: Nearest Town: To ber City, NC County Columbus 1007 Pireway Road, Tuber City, NC (Street Name, Numbers, Community, Subdivision, Lot No., Zip Code)	□Ridge □ (ch	raphic/Land setting Slope
3. OWNER: Mr. Donald Workson Address 1007 Pireway Roul (Street or Route No) Tabor City NC City or Town State Zip Code	(dcfa	rees/ininutes/seconds) ource: DGPS(\$\sqrt{Topographic ma}\) (check box) DRILLING LOG
(10) - 653 - 7836 Area code- Phone number	From To	Formation Description
4. DATE DRILLED 12/12/02 5. TOTAL DEPTH 25 FT 6. DOES WELL REPLACE EXISTING WELL? YES D NO X 7. STATIC WATER LEVEL Below Top of Casing: ± 4.5 FT	SCE	ATTACHED
(Use "+" if Above Top of Casing) 8 TOP OF CASING IS FT. Above Land Surface* "Top of casing terminated attor below land surface requires a variance in accordance with 15A NCAC 2C .0118.		
9. YIELD (gpm): NA METHOD OF TEST NA	LOCA	TION SKETCH
11 DISINFECTION Type NA Amount NA 12 CASING: Wall Thickness Depth Diameter or Weight/Ft Material From 0 To 80 Ft 2" 5Ch 40 PVC From Fo Ft From To Ft	two State Roads or numbers and comm	distance in miles from at least County Roads. Include the road on road names.
From 0 To 15 Ft Nent Cement Tremi From 15 To 18 Ft Bentonite In-Place	SEE	ATTACHED
14 SCREEN: Depth Diameter Slot Size Material From 20 To 25 Ft. 2 in. 0.010 in PVC From		
From To Ft Coarse (#2) SAND		
6. REMARKS:	and the second section of the	
DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN A		

Submit the original to the Division of Water Quality, Groundwater Section, 1636 Mail Service Center - Raleigh, NC 27699-1636 Phone No. (919) 733-3221, within 30 days. GW-1 REV. 07/2001



PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: M. Tate WELL NO.: MW1 DATE: 10/17/02 TIME: 3:00 p.m.

A car	WELL DIAMETER (INCHES)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	11.7
Ď	DEPTH TO LIQUID (FEET)	3.09
Ë	TOTAL LIQUID FEET IN WELL (C-D)	8.61
F	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	4.21
.H»	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
I	BAILER VOLUME (MEASURED/CALCULATED)	0.24
j	NO. BAILS REQUIRED ($G \div I$, IF BAILED)	17.54
K	NO. BAILS TAKEN (COUNTED)	20
L	GALLONS PURGED (MEASURED/CALCULATED)	4.8

WILLIAM COLLEGE				
PARAMETER	INITIAL	1ST VOLUME	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	14:50	14:55	15:00	
рН	9.1	9.2	9.2	
SPECIFIC CONDUCTIVITY (mS)	50,000+	50,000+	50,000+	
WATER TEMPERATURE (°C)	25	24	24	
DISSOLVED OXYGEN (mg/L)	2.65	2.96	3.52	
REDOX				

PER FOOT WELL VOLUMBS			
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT		
1.00	0.041		
1.25	0.064		
1.50	0.092		
2.00	0.163		
4.00	0.653		
6.00	1.469		

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: WMT WELL NO.: MW2 DATE: 11/04/02 TIME: 5:00pm

A	WELL DIAMETER (INCHES)	2
.B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	12
Ð	DEPTH TO LIQUID (FEET)	3.76
) (18)	TOTAL LIQUID FEET IN WELL (C-D)	8.24
ŕ	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	4.02
Ĥ	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
1	BAILER VOLUME (MEASURED/CALCULATED)	0.24
j	NO. BAILS REQUIRED (G ÷ I, IF BAILED)	16.78
ĸ	NO. BAILS TAKEN (COUNTED)	14
, L	GALLONS PURGED (MEASURED/CALCULATED)	3.36

PARAMETER	INITIAL	1ST VOLUME	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	16:40	16:50	17:00	NA
рН	5.9	5.7	5.5	NA
SPECIFIC CONDUCTIVITY (mS)	275	235	250	NA
WATER TEMPERATURE (°C)	20.5	21	21	NA
DISSOLVED OXYGEN (AFTER PURGING)(mg/L)	2.26			
REDOX	NA			

PER FOOT WELL VOLUMES		
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT	
1.00	0.041	
1.25	0.064	
1.50	0.092	
2.00	0.163	
4.00	0.653	
6.00	1.469	

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: WMT WELL NO.: MW3 DATE: 11/04/02 TIME: 4:30pm

À	WELL DIAMETER (INCHES)	2
В	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	12
D	DEPTH TO LIQUID (FEET)	3.93
æ	TOTAL LIQUID FEET IN WELL (C-D)	8.07
æ	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	3.94
H	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
i	BAILER VOLUME (MEASURED/CALCULATED)	0.24
	NO. BAILS REQUIRED (G ÷ I, IF BAILED)	16.40
K	NO. BAILS TAKEN (COUNTED)	14
L	GALLONS PURGED (MEASURED/CALCULATED)	3.36

PARAMETER	INITIAL	ist Volume	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	16:10	16:20	16:30	NA
рН	6.8	6.7	6.2	NA
SPECIFIC CONDUCTIVITY (mS)	170	170	165	NA
WATER TEMPERATURE (°C)	21	21	21	NA
DISSOLVED OXYGEN (AFTER PURGING)(mg/L)	1.73			
REDOX		1	NA.	

PER FOOT WELL VOLUMES		
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT	
1.00	0.041	
1.25	0.064	
1.50	0.092	
2.00	0.163	
4.00	0.653	
6.00	1.469	

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: WMT WELL NO.: MW4 DATE: 11/11/02 TIME: 3:40pm

À	WELL DIAMETER (INCHES)	2
В	GALLONS/FOOT	0.163
c	TOTAL WELL DEPTH (FEET)	12
D	DEPTH TO LIQUID (FEET)	2.83
E	TOTAL LIQUID FEET IN WELL (C-D)	9.17
Ř	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
Ğ	TOTAL GALLONS TO PURGE (B x E x F)	4.48
. H	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
	BAILER VOLUME (MEASURED/CALCULATED)	0.24
3	NO. BAILS REQUIRED (G ÷ I, IF BAILED)	18.68
K	NO. BAILS TAKEN (COUNTED)	14
L	GALLONS PURGED (MEASURED/CALCULATED)	3.36

PARAMÉTÉR:	INITIAL	i st Volume	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	15:28	15:33	15:38	NA
рН	7.3	6.6	6.2	NA
SPECIFIC CONDUCTIVITY (mS)	120	105	95	NA
WATER TEMPERATURE (°C)	24	23.5	23	NA
DISSOLVED OXYGEN (AFTER PURGING)(mg/L)	5.24			
REDOX	NA			

PER FOOT WELL VOLUMES		
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT	
1.00	0.041	
1.25	0.064	
1.50	0.092	
2.00	0.163	
4.00	0.653	
6.00	1.469	

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: WMT WELL NO.: MW5 DATE: 11/11/02 TIME: 4:05pm

A	WELL DIAMETER (INCHES)	2
В	GALLONS/FOOT	0.163
	TOTAL WELL DEPTH (FEET)	12
D	DEPTH TO LIQUID (FEET)	3.02
E	TOTAL LIQUID FEET IN WELL (C-D)	8.98
P	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	4.39
Ĥ	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
1	BAILER VOLUME (MEASURED/CALCULATED)	0.24
.	NO. BAILS REQUIRED (G \div I, IF BAILED)	18.29
ĸ	NO. BAILS TAKEN (COUNTED)	14
Ľ.	GALLONS PURGED (MEASURED/CALCULATED)	3.36

PARAMETER	INITIAL		2ND VOLUME	3RD VOLUME
TIME (MILITARY)	15;50	15:57	16:00	NA
pH	7.7	NA	6.9	NA
SPECIFIC CONDUCTIVITY (mS)	40	NA	45	NA
WATER TEMPERATURE (°C)	22	NA	22	NA
DISSOLVED OXYGEN (AFTER PURGING)(mg/L)		5	.18	
REDOX		J	NA	

PER FOOT WELL VOLUMES			
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT		
1.00	0.041		
1.25	0.064		
1.50	0.092		
2.00	0.163		
4.00	0.653		
6.00	1.469		

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: M. Tate WELL NO.: MW6 DATE: 12/18/02 TIME: 12:04 p.m.

À	WELL DIAMETER (INCHES)	2
B	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	12
D	DEPTH TO LIQUID (FEET)	3.88
E	TOTAL LIQUID FEET IN WELL (C-D)	8.12
Por	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	3.9
H	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
L	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I, IF BAILED)	16.5
K	NO. BAILS TAKEN (COUNTED)	17
L	GALLONS PURGED (MEASURED/CALCULATED)	4.08

Will Bills the Dr. Old the Town Selection Approximation (May 1998) The Co. 1 1 King the High	INITIAL	1ST VOLUME	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	11:49	11:54	11:59	12:04
рН	10.0	10.1	10.2	9.9
SPECIFIC CONDUCTIVITY (mS)	74	98	75	67
WATER TEMPERATURE (°C)	NA	NA	NA	NA
DISSOLVED OXYGEN (mg/L)		3.	.46	
REDOX		N	IA.	

PER FOOT WELL VOLUMES				
WELL DIAMETER GALLONS PER (IN INCHES) FOOT				
1.00	0.041			
1.25	0.064			
1.50	0.092			
2.00	0.163			
4.00	0.653			
6.00	1.469			

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: M. Tate WELL NO.: DW1 DATE: 11/15/02 TIME: 12:05 p.m.

A	WELL DIAMETER (INCHES)	2
В	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	25.0
D	DEPTH TO LIQUID (FEET)	5.01
E	TOTAL LIQUID FEET IN WELL (C-D)	19.99
. P.	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	9.77
\mathbf{H}_{i}	PURGING METHOD (BAILER OR PUMP TYPE)	Pump
1	BAILER VOLUME (MEASURED/CALCULATED)	0.24
J	NO. BAILS REQUIRED (G ÷ I, IF BAILED)	NA
K	NO. BAILS TAKEN (COUNTED)	NA
L	GALLONS PURGED (MEASURED/CALCULATED)	40.00

PARAMETER	INITIAL	1ST VOLUMB	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	10:52	11:11	11:46	11:56
рН	9.3	9.6	8.8	8.9
SPECIFIC CONDUCTIVITY (mS)	125	70	40	40
WATER TEMPERATURE (°C)	23	23	24	24
DISSOLVED OXYGEN (mg/L)	2.19	5.27	3.86	4.09
REDOX		1	NA.	

PER FOOT WELL VOLUMES		
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT	
1.00	0.041	
1.25	0.064	
1.50	0.092	
2.00	0.163	
4.00	0.653	
6.00 -	1.469	

PROJECT NAME: Watson Lands LOCATION: Tabor City, NC CES PROJECT NO: 02141 PERSONNEL: M. Tate WELL NO.: DW2 DATE: 12/18/02 TIME: 12:41 p.m.

. A.	WELL DIAMETER (INCHES)	2
В	GALLONS/FOOT	0.163
C	TOTAL WELL DEPTH (FEET)	25
D	DEPTH TO LIQUID (FEET)	4.34
В	TOTAL LIQUID FEET IN WELL (C-D)	20.66
.P	NO. WELL VOLUMES DESIRED (SITE SPECIFIC, USUALLY 3)	3
G	TOTAL GALLONS TO PURGE (B x E x F)	10.10
H	PURGING METHOD (BAILER OR PUMP TYPE)	Bailer
* L	BAILER VOLUME (MEASURED/CALCULATED)	0.24
	NO. BAILS REQUIRED (G \div I, IF BAILED)	42
K	NO. BAILS TAKEN (COUNTED)	43
L	GALLONS PURGED (MEASURED/CALCULATED)	10.32

PARAMETER	INITIAL	IST VOLUME	2ND VOLUME	3RD VOLUME
TIME (MILITARY)	11:59	12:13	12:27	12:41
Ph	8.4	9.3	8.7	8.5
SPECIFIC CONDUCTIVITY (mS)	642	394	376	359
WATER TEMPERATURE (°C)	NA	NA	NA	NA
DISSOLVED OXYGEN (mg/L)		1	.68	
REDOX		N	ŇΑ	

PER FOOT WELL VOLUMES			
WELL DIAMETER (IN INCHES)	GALLONS PER FOOT		
1.00	0.041		
1.25	0.064		
1.50	0.092		
2.00	0.163		
4.00	0.653		
6.00	1.469		

2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Ms. JoAnne Shadroui Clark Environmental Services PO Box 10136 Wilmington, NC 28405 October 25, 2002

Report Number: G211-1483

Client Project ID: 02141

Dear Ms. Shadroui,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Raradigm Analytical Laboratories, Inc.

Laboratory Director

J. Patrick Weaver

Results for Inorganics by IC 300.0

Client Sample ID: MW1 Client Project ID: 02141 Lab Sample ID: 54863 Lab Project ID: G211-1483 Analyzed By: PSW
Date Collected: 10/17/02
Date Received: 10/18/02
Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	10/19/02	1000	200	8800

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics

Client Sample ID: MW1 Client Project ID: 02141 Lab Sample ID: 54863 Lab Project ID: G211-1483

Analyzed By: EC
Date Collected: 10/17/02
Date Received: 10/18/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	28000	0.1	mg/l	351.3	10/23/02
Ammonia	16520	0.1	mg/l	350.2	10/24/02
Nitrite	98.5	0.025	mg/l	353.3	10/18/02

Note:

BQL = Below Quantitation Limit Analysis performed by Envirochem,Inc.

Reviewed By

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2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Ms. JoAnne Shadroui Clark Environmental Services PO Box 10136 Wilmington, NC 28405 November 20, 2002

Report Number: G211-1492

Client Project ID: Watson Lands

Dear Ms. Shadroui,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director

J. Patrick Weaver

Results for Inorganics by IC 300.0

Client Sample ID: MW2

Client Project ID: Watson Lands Lab Sample ID: 55938

Lab Project ID: G211-1492

Analyzed By: PSW

Date Collected: 11/4/02 Date Received: 11/5/02

Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/5/02	2.0	0.4	24

Comments:

All values corrected for dilution.

Flags:

PARADIGM ANALYTICAL LABORATORIES, INC. Results for Inorganics

Client Sample ID: MW2
Client Project ID: Watson Lands
Lab Sample ID: 55938
Lab Project ID: G211-1492

Analyzed By: EC
Date Collected: 11/4/02
Date Received: 11/5/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	27.1	0.1	mg/l	351.3	11/7/02
Ammonia	17.1	0.1	mg/l	350.2	11/7/02
Nitrite	0.15	0.025	mg/l	353.3	11/6/02

Note:

BQL = Below Quantitation Limit
Analysis performed by Envirochem,Inc.

Results for Inorganics by IC 300.0

Client Sample ID: MW3
Client Project ID: Watson Lands
Lab Sample ID: 55939
Lab Project ID: G211-1492

Analyzed By: PSW
Date Collected: 11/4/02
Date Received: 11/5/02
Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/5/02	2.0	0.4	20

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics

Client Sample ID: MW3
Client Project ID: Watson Lands
Lab Sample ID: 55939
Lab Project ID: G211-1492

Analyzed By: EC
Date Collected: 11/4/02
Date Received: 11/5/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	16.5	0.1	mg/l	351.3	11/7/02
Ammonia	0.7	0.1	mg/l	350.2	11/7/02
Nitrite	BQL	0.025	mg/l	353.3	11/6/02

Note:

BQL = Below Quantitation Limit
Analysis performed by Envirochem, Inc.

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2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Mr. Mike Tate Clark Environmental Services PO Box 10136 Wilmington, NC 28405 November 25, 2002

Report Number: G211-1495

Client Project ID: Watson Lands

Dear Mr. Tate,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director

J. Patrick Weaver

Results for Inorganics by IC 300.0

Client Sample ID: MW4
Client Project ID: Watson Lands
Lab Sample ID: 56557
Lab Project ID: G211-1495

Analyzed By: PSW
Date Collected: 11/11/02
Date Received: 11/12/02
Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/12/02	1 0	0.2	11

Comments:

All values corrected for dilution.

Flags:

BQL = Below quantitation limit

Reviewed By:

Results for Inorganics

Client Sample ID: MW4
Client Project ID: Watson Lands
Lab Sample ID: 56557
Lab Project ID: G211-1495

Analyzed By EC
Date Collected: 11/11/02
Date Received: 11/12/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	11.3	0.1	mg/l	351.3	11/14/02
Ammonia	0.8	0.1	mg/l	350.2	11/21/02
Nitrite	BQL	0.025	mg/l	353.3	11/13/02

Note: BQL = Below

BQL = Below Quantitation Limit
Analysis performed by Envirochem, Inc.

Results for Inorganics

by IC 300.0

Client Sample ID: MW5
Client Project ID: Watson Lands
Lab Sample ID: 56558

Lab Project ID: G211-1495

Analyzed By: PSW
Date Collected: 11/11/02
Date Received: 11/12/02

Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/12/02	1.0	0.2	0.97

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics

Client Sample ID: MW5

Client Project ID: Watson Lands
Lab Sample ID: 56558

Lab Project ID: G211-1495

Analyzed By: EC
Date Collected: 11/11/02
Date Received: 11/12/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	7.8	0 1	mg/l	351.3	11/14/02
Ammonia	1.1	0.1	mg/l	350.2	11/21/02
Nitrite	BQL	0.025	mg/l	353.3	11/13/02

Note:

BQL = Below Quantitation Limit

Analysis performed by Envirochem, Inc.

Reviewed By: WC

PARADIGM ANALYTICA 2627 Northchase Parkway S Phone: (910)-350-1903 FA	E, Wilmin	, Wilmington, NC 28405 Chain-of Custody Record & Analytical Request											COC# of of			
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2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Mr. Mike Tate Clark Environmental Services PO Box 10136 Wilmington, NC 28405 December 2, 2002

Report Number: G211-1498

Client Project ID: Watson Lands

Dear Mr. Tate,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Laboratory Director

J. Patříck Weaver

Results for Inorganics by IC 300.0

Client Sample ID: DW1
Client Project ID: Watson Lands
Lab Sample ID: 57068
Lab Project ID: G211-1498

Analyzed By: PSW
Date Collected: 11/15/02
Date Received: 11/15/02
Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/15/02	1.0	0.2	0.24

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics

Client Sample ID: DW1
Client Project ID: Watson Lands
Lab Sample ID: 57068
Lab Project ID: G211-1498

Analyzed By EC
Date Collected 11/15/02
Date Received 11/15/02
Matrix, Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	0.1	0.1	mg/l	351 3	11/21/02
Ammonia	BQL	0.1	mg/l	350 2	11/21/02
Nitrite	BQL	0.025	mg/l	353 3	11/15/02

Note:

BQL = Below Quantitation Limit
Analysis performed by Envirochem,Inc.

Reviewed By:

. N.C. Certification #481 S.C. Certification #99029

627 Northchase Parkway SE, Wilmington, NC 28405

'hone: (910)-350-1903 FAX: (910)-350-1557

Chain-of Custody Record & Analytical Request

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2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Mr. Mike Tate Clark Environmental Services PO Box 10136 Wilmington, NC 28405

December 2, 2002

Report Number: G211-1497

Client Project ID: Watson Lands

Dear Mr. Tate,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paladigm Analytical Laboratories, Inc.

Laboratory Director

J. Patrick Weaver

Results for Inorganics

by IC 300.0

Client Sample ID SW2 Client Project ID Watson Lands Lab Sample ID 56708 Lab Project ID G211-1497

Analyzed By. PSW Date Collected: 11/13/02 Date Received: 11/14/02 Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	11/14/02	1.0	0.2	5.4

real Pr

Comments:

All values corrected for dilution

Flags:

BQL = Below quantitation limit

Reviewed By:

Results for Inorganics

Client Sample ID: SW2
Client Project ID: Watson Lands
Lab Sample ID: 56708
Lab Project ID: G211-1497

Analyzed By: EC
Date Collected: 11/13/02
Date Received: 11/14/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	0.5	0.1	mg/l	351 3	11/21/02
Ammonia	0.1	0.1	mg/l	350.2	11/21/02
Nitrite	BQL	0.025	mg/l	353.3	11/14/02

Note:

BQL = Below Quantitation Limit
Analysis performed by Envirochem,Inc.

Reviewed By $\sqrt{\mathcal{N}}$

N.C. Certification #481 S.C. Certification #99029

COC#

Chain-of Custody Record & Analytical Request 527 Northchase Parkway SE, Wilmington, NC 28405 none: (910)-350-1903 FAX: (910)-350-1557 ddress: Pu Bx 10136 Project ID: Watson Lands Date: 11/14/07 Report To: CES

Contact: M. Tak or Pay Clark Turnaround: Standard Phone: (910) 602.3900 Job Number: 02141 ddress: Wilmington NC 28404 Invoice To: ______ Fax: (910) 602 · 3975 P.O. Number: 02141111402036 uote #: _____ Comments: Analyses **Preservatives** Please specify any special reporting AMMONIA requirements Time Matrix ĺη Sample ID Date H2504 Caucillater M. Take 17 G'211-1197 1/13/02 4:15p HZO K DW1 "/13/02 4:45p X H20 SW2 Х **State Certification Requested Temperature** Received By Time Date Time Relinquished By Date 1/14/02 4:25 9:25 onico

NC _____ Other _____

SEE REVERSE FOR TERMS AND CONDITIONS



2627 Northchase Parkway S.E. Wilmington, North Carolina 28405 (910) 350-1903 Fax (910) 350-1557

Mr. Mike Tate Clark Environmental Services PO Box 10136 Wilmington, NC 28405

December 23, 2002

Report Number: G211-1508

Client Project ID: Watson Lands

Dear Mr. Tate,

Enclosed are the results of the analytical services performed under the referenced project. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or the services performed during this project, please call for assistance. We will be happy to answer any questions or concerns which you may have.

Thank you for using Paradigm Analytical Labs for your analytical services. We look forward to working with you again on any additional analytical needs which you may have.

Sincerely,

Paradigm Analytical Laboratories, Inc.

Results for Inorganics by IC 300.0

Client Sample ID: MW6
Client Project ID: Watson Lands
Lab Sample ID: 59197
Lab Project ID: G211-1508

Analyzed By: PSW
Date Collected: 12/18/02
Date Received: 12/18/02
Matrix: Water

Compound	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate	12/18/02	1.0	0.2	BQL

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics by IC 300.0

Client Sample ID: DW2
Client Project ID: Watson Lands
Lab Sample ID: 59198
Lab Project ID: G211-1508

Analyzed By: PSW
Date Collected: 12/18/02
Date Received: 12/18/02
Matrix: Water

Compound	,	Date Analyzed	Dilution	Quantitation Limit (mg/L)	Result (mg/L)
Nitrate		12/19/02	5.0	1	48

Comments:

All values corrected for dilution.

Flags:

Results for Inorganics

Client Sample ID: MW6

Client Project ID: Watson Lands
Lab Sample ID: 59197
Lab Project ID: G211-1508

Analyzed By: EC
Date Collected: 12/18/02
Date Received: 12/18/02
Matrix: Water

Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	1.0	0.1	mg/L	351.3	12/20/02
Ammonia	BQL	0.1	mg/L	350.2	12/20/02
Nitrite	BQL	0.025	mg/L	353.3	12/19/02

· Note:

BQL = Below Quantitation Limit
Analysis performed by Envirochem, Inc.

Results for Inorganics

Client Sample ID: DW2

Client Project ID: Watson Lands
Lab Sample ID: 59198
Lab Project ID: G211-1508

Analyzed By: EC
Date Collected: 12/18/02
Date Received: 12/18/02
Matrix: Water

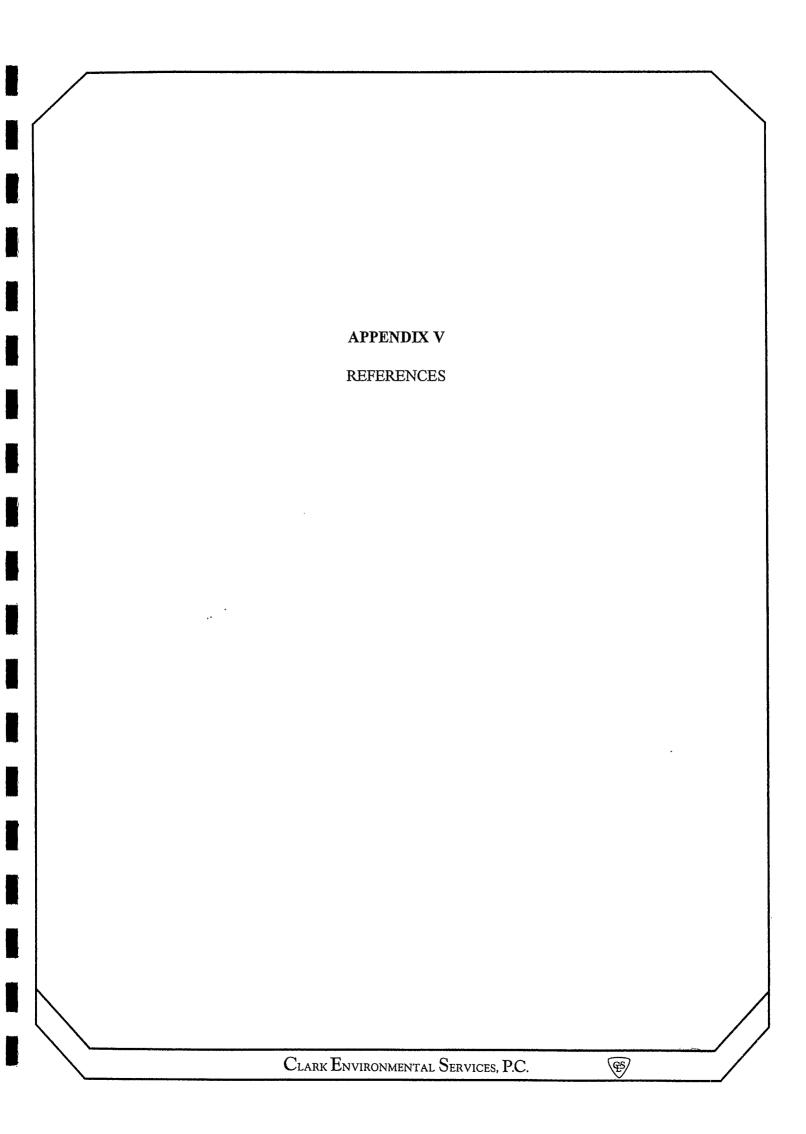
Parameter	Result	Quantitation Limit	Units	Procedure	Date Analyzed
TKN	26.4	0.1	mg/L	351.3	12/20/02
Ammonia	25	0.1	mg/L	350.2	12/20/02
Nitrite	BQL	0.025	mg/L	353.3	12/19/02

. Note:

BQL = Below Quantitation Limit

Analysis performed by Envirochem, Inc.

2627 Northchase Pa	PARADIGM ANALYTICAL LABORATORIES, INC. 627 Northchase Parkway SE, Wilmington, NC 28405 Chain-of Custody Record & Analytical Request Phone: (910)-350-1903 FAX: (910)-350-1557															34081 se <u>l</u> of <u>/</u>		
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References

- Clark Environmental Services, P.C., Phase I Environmental Site Assessment and Modified Phase II Subsurface Investigation Report, January 8, 2003.
- North Carolina Administrative Code, Title 15A, Chapter 2, Subchapter 2L, Sections .0100, .0200, and .0300, Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina, November 20, 1998.
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- North Carolina Department of Natural Resources and Community Development, Land Resources Division, *Geologic Map of North Carolina*, 1985.
- Smith Well Drilling and Repair, Tabor City, North Carolina, personal communication with Mr. George Smith, January 2003.
- United States Department of the Interior, Geological Survey, *Tabor City East Quadrangle*, *North Carolina South Carolina*, 7.5 minute series (topographic), 1962.
- Winner, M.D. and R.W. Coble, *Hydrogeologic Framework of the North Carolina Coastal Plain*, United States Geological Survey, Professional Paper 1404-I, 1996.